Single Aisle
TECHNICAL TRAINING MANUAL
T1+T2 (IAE V2500) (Lvl 2&3)
COMMUNICATIONS

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COMMUNICATIONS

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COMMUNICATIONS SYSTEM COMPONENT LOCATION (2)

SYSTEM OVERVIEW - RADIO COMMUNICATION

The communications system of the single aisle aircraft has two sub-systems:
- radio communication,
- on-board communication.

The radio communication systems are used for communications to and from the aircraft.

The radio communication system is used for the communication of the crew with ground stations and with other aircraft through VHF Data Radio (VDR), High Frequency Data Radio (HFDR) and SATCOM if installed.

The VHF transceivers are the same and interchangeable. The HF transceivers are also the same and interchangeable. VDR 1 and VDR 2 are usually used by the flight crew for voice communications. VDR 3 is used for Air Traffic Service Unit (ATSU) functions and as back-up voice communications if there is a failure of system 1 or 2.

The HF transceivers are used when the aircraft is not in the applicable range of the VHF radios.

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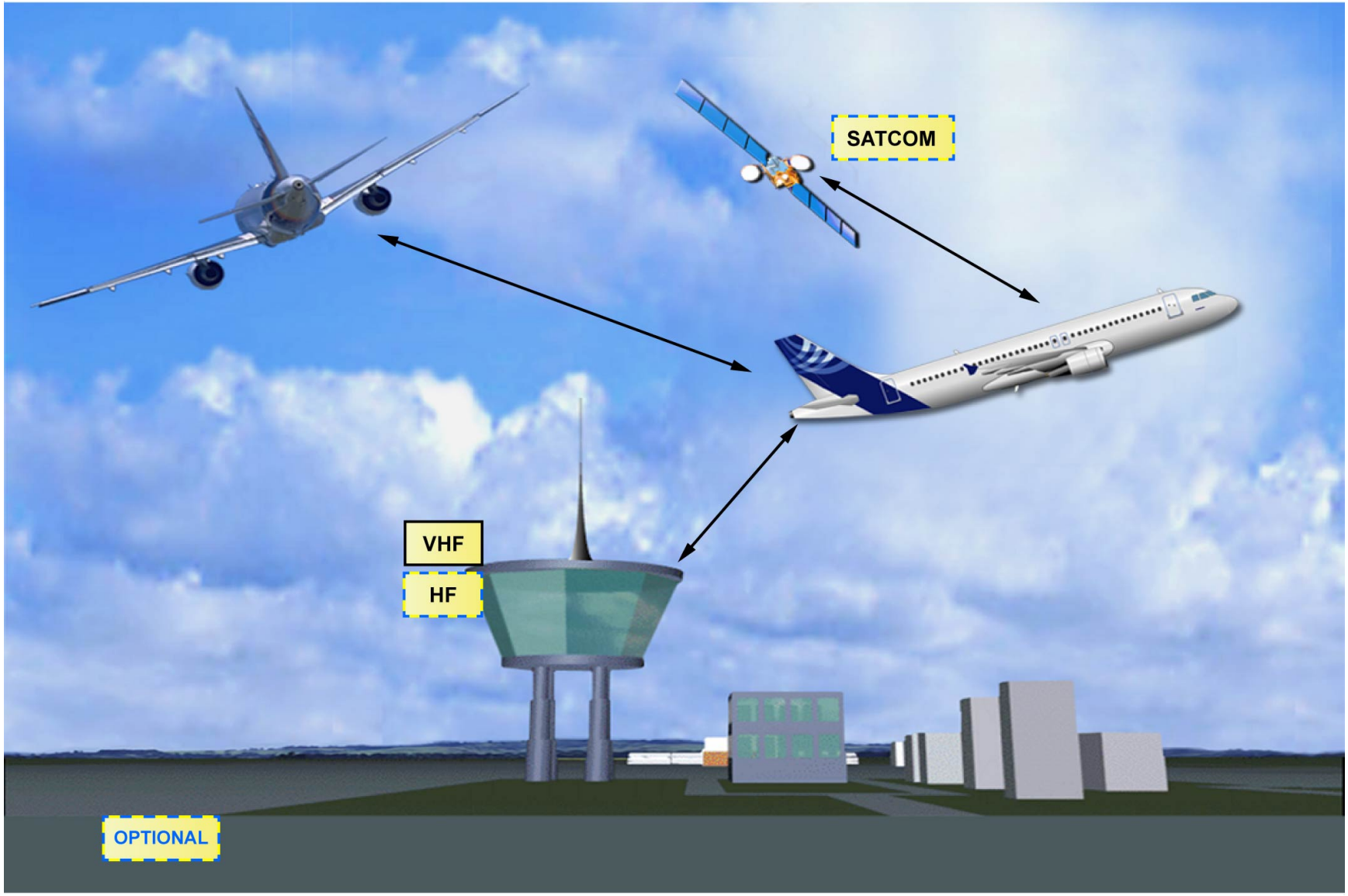
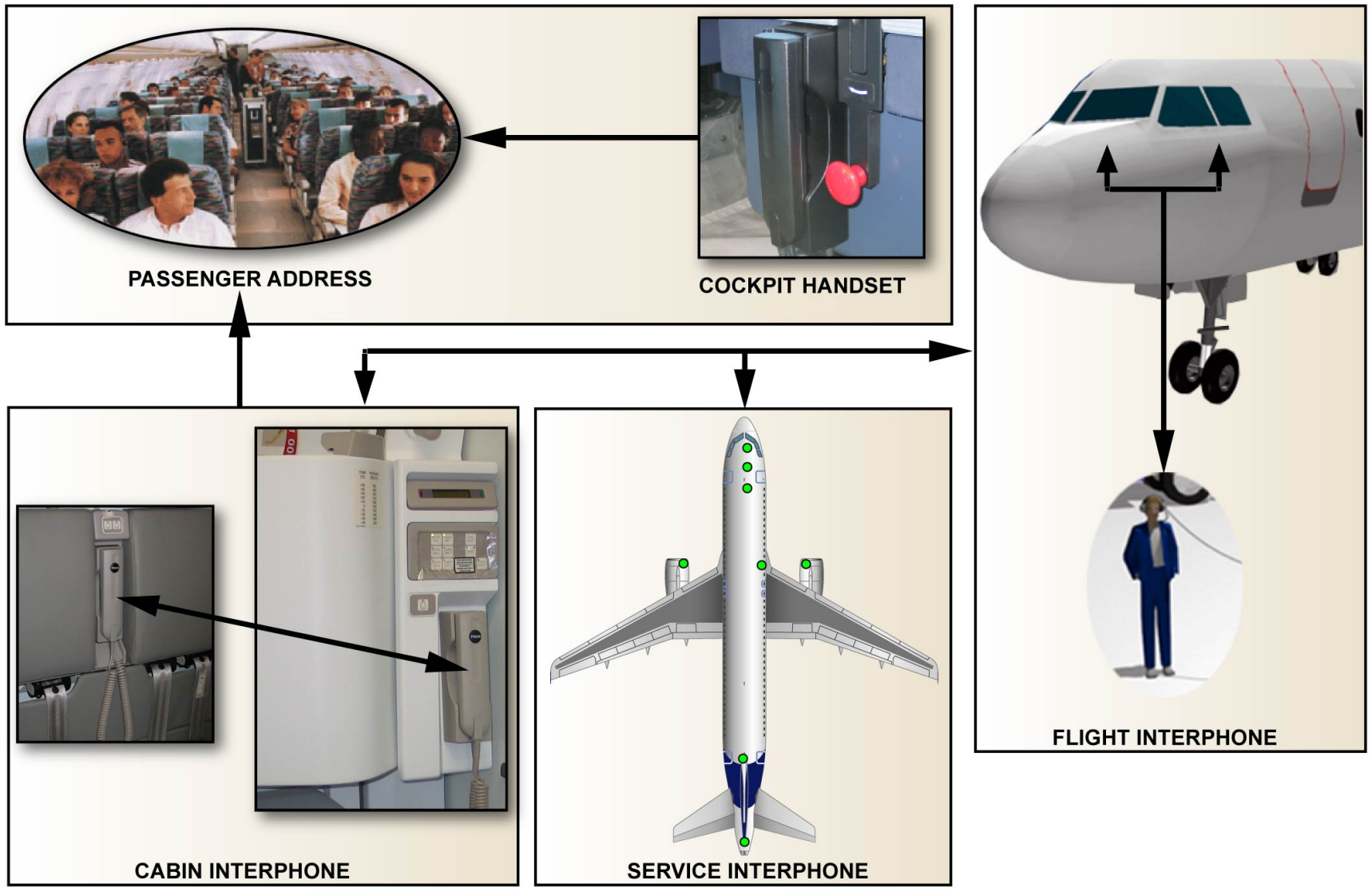


SYSTEM OVERVIEW - RADIO COMMUNICATION

COMMUNICATIONS SYSTEM COMPONENT LOCATION (2)

SYSTEM OVERVIEW - ON-BOARD COMMUNICATION SYSTEM

The on-board internal communication system is divided into 4 functions:
- Service interphone (on ground only) for maintenance technician communication with cockpit or cabin (for this, many jack connectors are installed around the A/C),
- Flight interphone for cockpit internal communication and communication with the ground mechanic,
- Passenger Address (PA) from the cockpit or from cabin crew stations for passenger announcements,
- Cabin interphone for cabin crew or cabin crew/pilots communication.



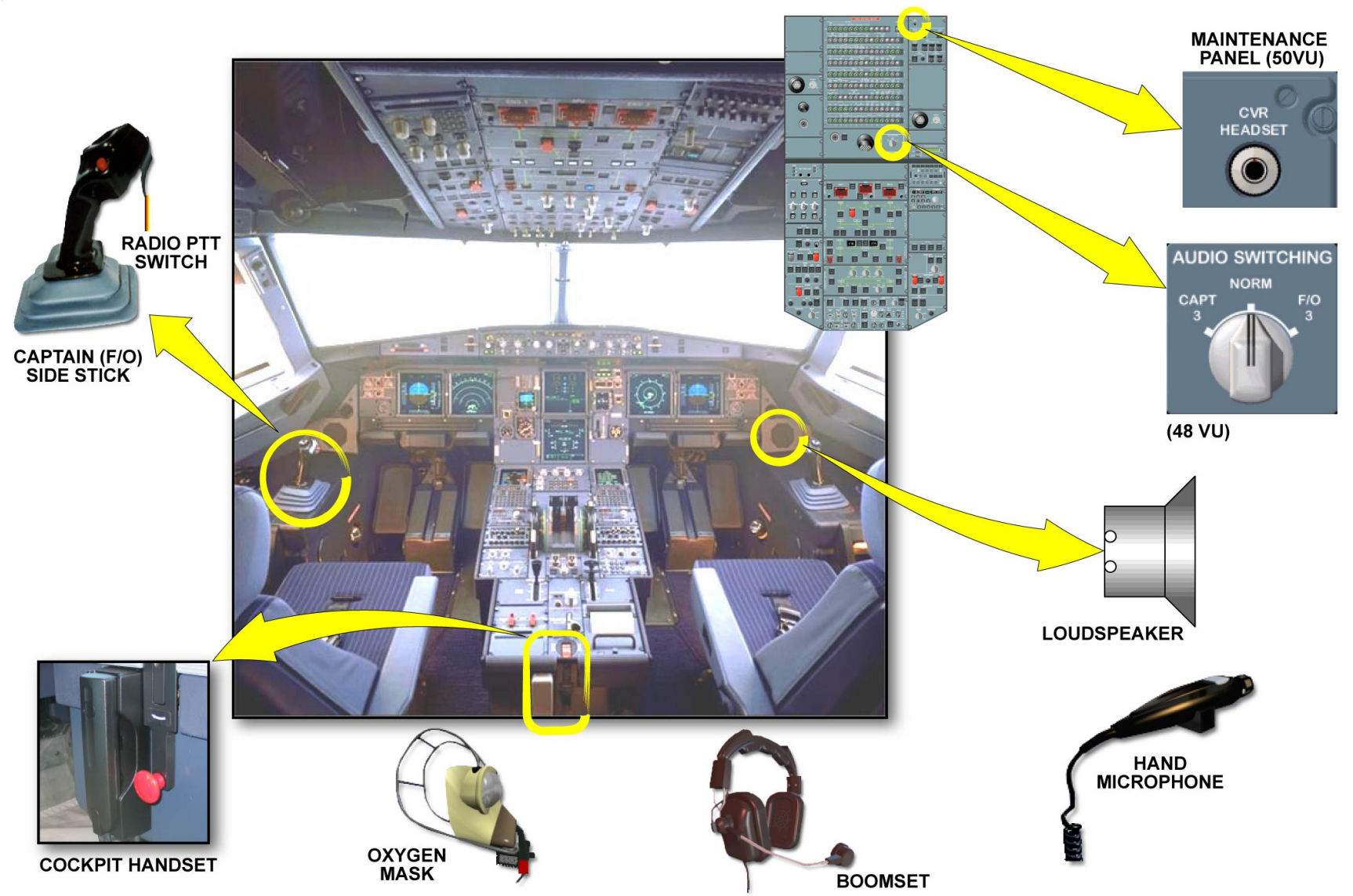
SYSTEM OVERVIEW - ON-BOARD COMMUNICATION SYSTEM

COMMUNICATIONS SYSTEM COMPONENT LOCATION (2)

COMPONENT LOCATION

COCKPIT PERIPHERALS & ACOUSTIC EQUIPMENT

Many peripherals and acoustic equipment are installed in the cockpit.



COMPONENT LOCATION - COCKPIT PERIPHERALS & ACOUSTIC EQUIPMENT

COMMUNICATIONS SYSTEM COMPONENT LOCATION (2)

COMPONENT LOCATION (continued)

ANTENNAS

The HF antenna is installed behind the leading edge of the vertical stabilizer. All the other antennae are installed on the outer skin of the aircraft.

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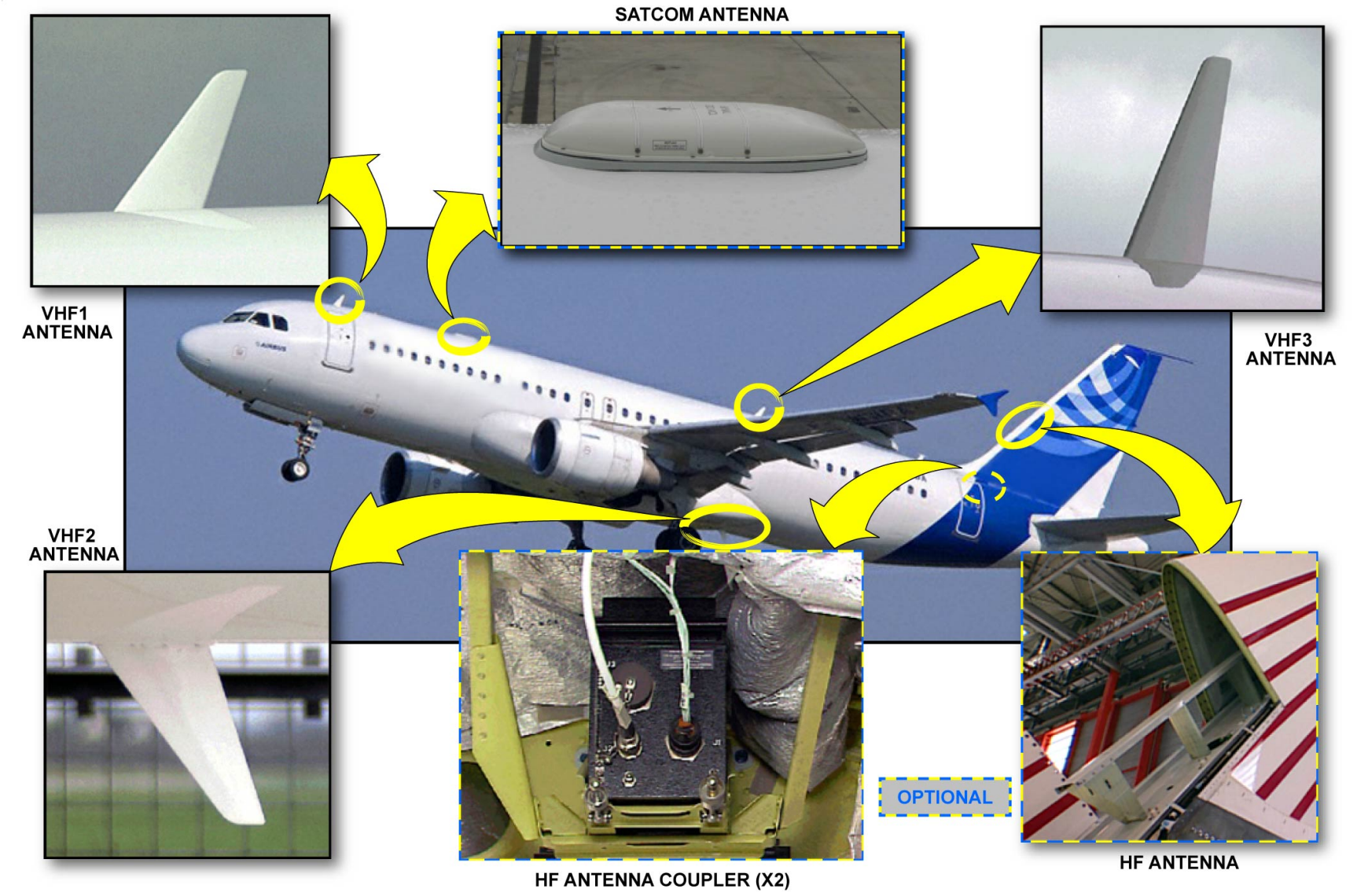

COMPONENT LOCATION - ANTENNAS

COMMUNICATIONS SYSTEM COMPONENT LOCATION (2)

COMPONENT LOCATION (continued)

TRANSCEIVERS, AMU, SELCAL CODE PANEL

The SELCAL panel, AMU, HF and VHF Line Replaceable Units (LRUs) are in the aft avionics compartment.
For data communication, optional VDR (VHF Data Radio) & HFDR (HF Data Radio) transceivers can be used.

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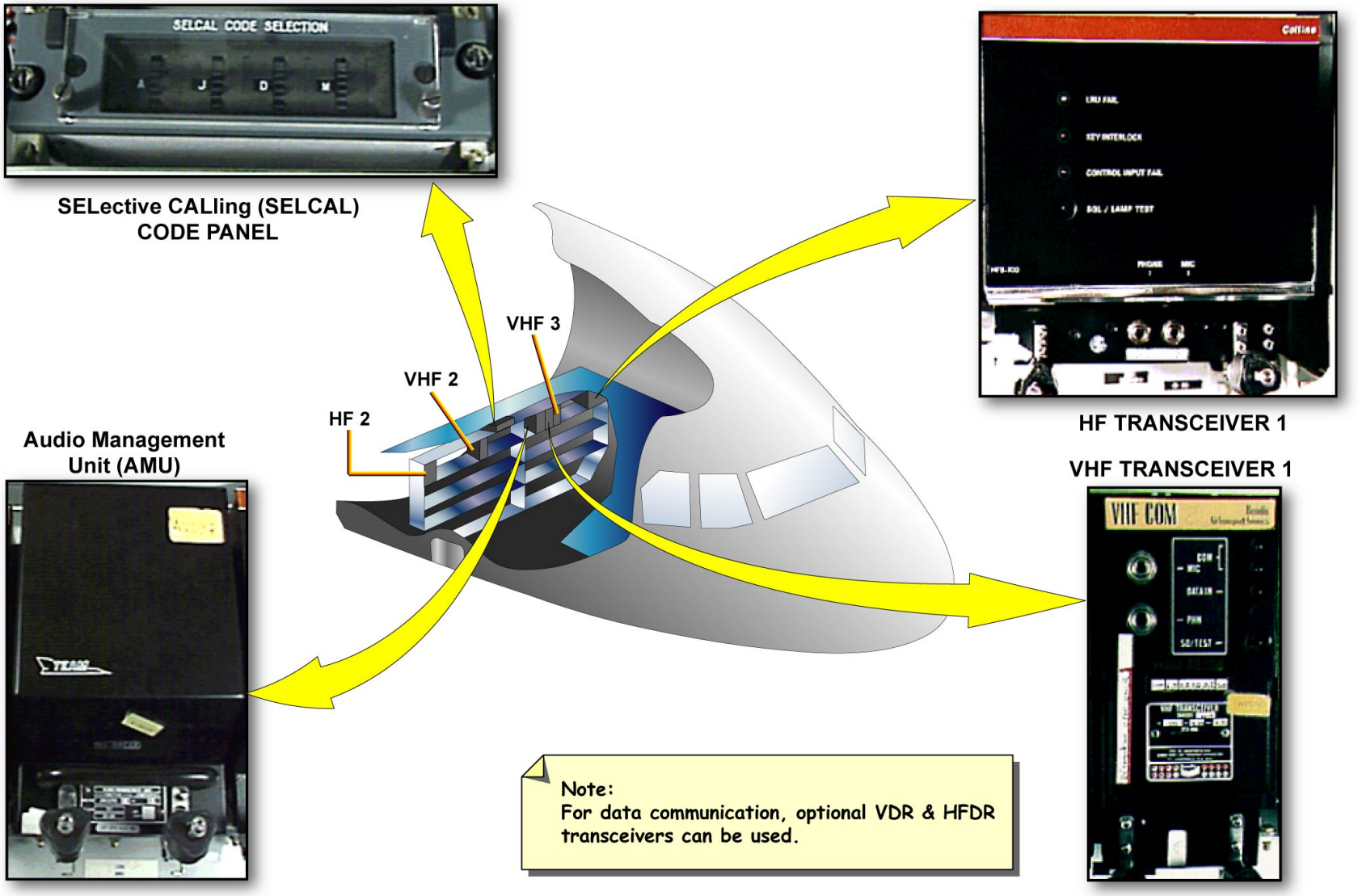

COMPONENT LOCATION - TRANSCEIVERS, AMU, SELCAL CODE PANEL

COMMUNICATIONS SYSTEM COMPONENT LOCATION (2)

COMPONENT LOCATION (continued)

SATCOM (OPTIONAL)

The SATellite COMmunication system (SATCOM) includes the Satellite Data Unit (SDU).
The SDU is installed in the aft avionics rack 80VU.

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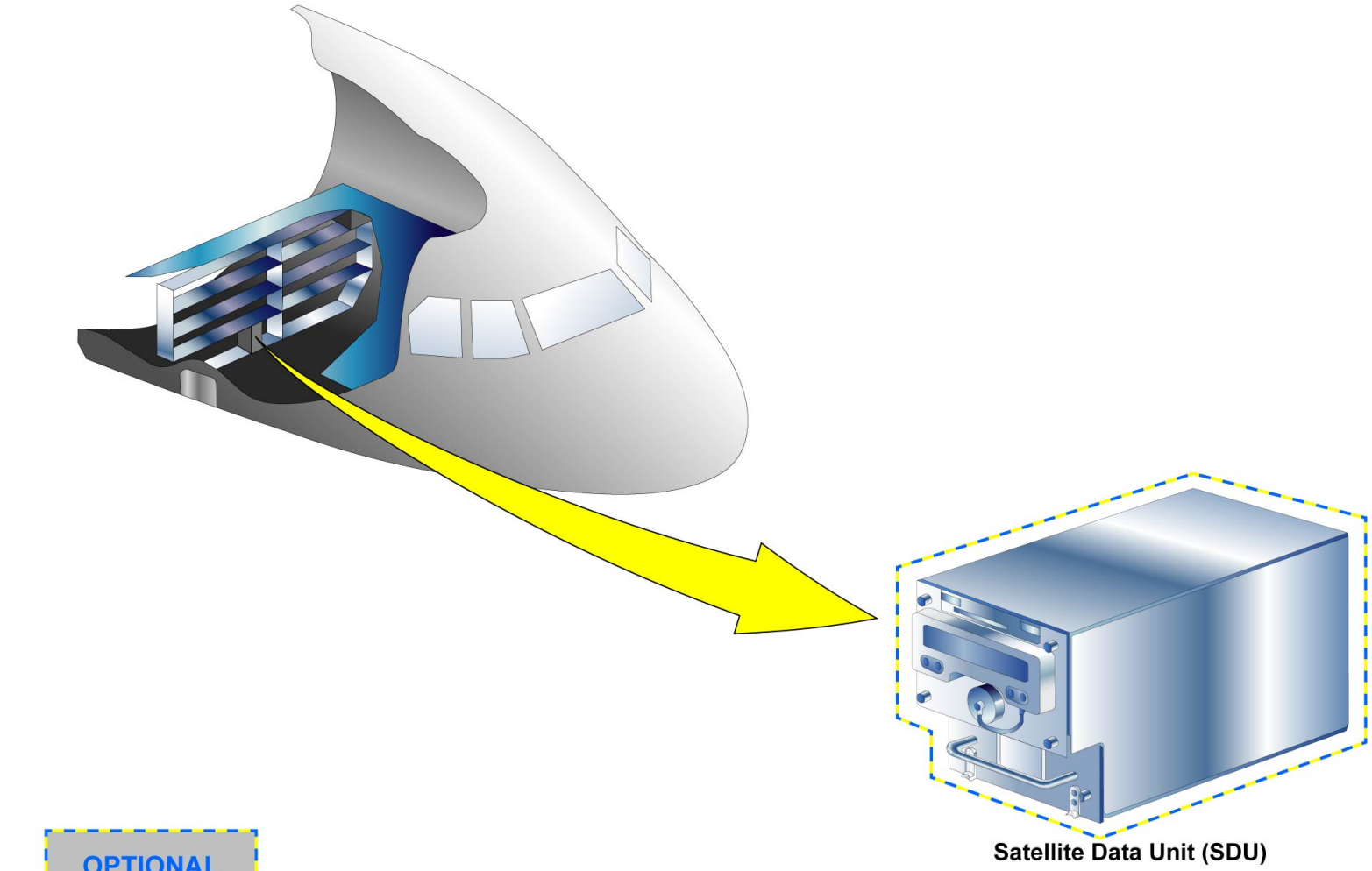

COMPONENT LOCATION - SATCOM (OPTIONAL)

COMMUNICATIONS SYSTEM COMPONENT LOCATION (2)

COMPONENT LOCATION (continued)

SSCVR

The Solid State Cockpit Voice Recorder is installed in the rear fuselage.

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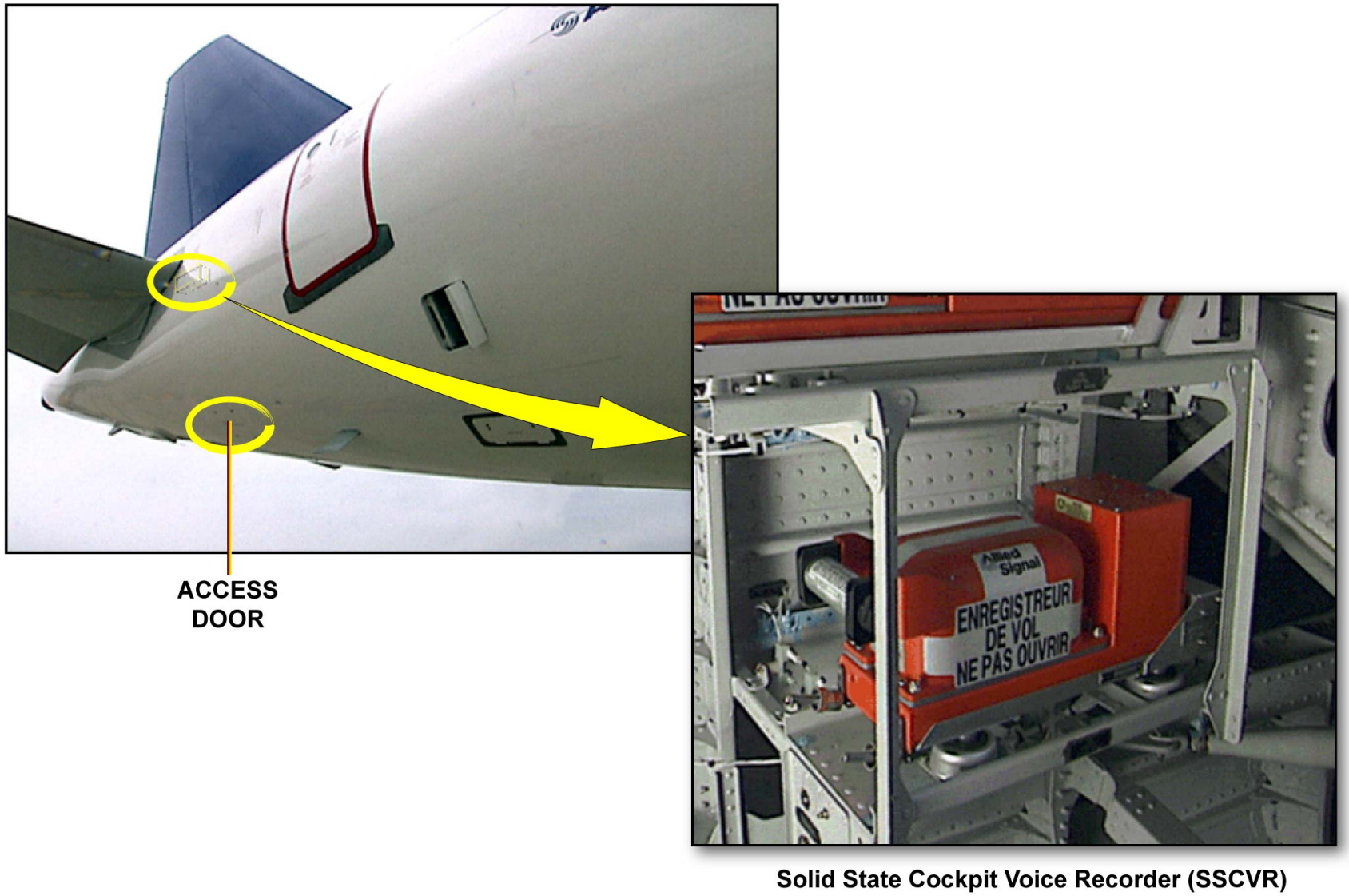

Solid State Cockpit Voice Recorder (SSCVR)

COMPONENT LOCATION - SSCVR

COMMUNICATION SYSTEM CONTROL & INDICATING (2)

RADIO COMMUNICATION OVERVIEW

INTERPHONE / CALLS / EVAC / VOICE RECORDING

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RADIO MANAGEMENT PANEL INTERFACES (3)

RADIO

Radio Management Panel (RMP) 1 and RMP 2 have two ARINC 429 data buses connected to the radio communication transceivers (XCVRs):
- COM BUS 1 delivers the VHF 1 frequency,
- COM BUS 2 delivers the VHF 2 frequency.

Three dialog buses are used for the exchange of information between the three RMPs. Each RMP periodically transmits its context on its dialog bus. Each RMP can control any radio XCVR but is more particularly dedicated to one system. Basic allocation:
- RMP 1 VHF 1,
- RMP 2 VHF 2.

Possible allocation (depending on options):
- RMP 3 HF 1, HF 2 and VHF 3.

NOTE: Air Traffic Service Unit (ATSU) uses VHF 3 for data transmission.

NAVIGATION

If the standby navigation mode is selected, the navigation systems frequencies are controlled by RMP 1 and RMP 2 only. The standby navigation is selected in the event of failure of both Flight Management and Guidance Computers (FMGCs). In this condition:
- RMP 1 controls VOR 1, Automatic Direction Finder 1 (ADF) and Instrument Landing System 1 (ILS) and 2,
- RMP 2 controls VOR 2, ADF 2 and ILS 1 and 2.

For ILS functions, Multi-Mode Receivers (MMRs) 1 and 2 always operate on the same frequency which can be controlled from any RMP, either directly or through the cross talk bus.

FMGC

In normal operation, the navigation systems are tuned automatically or manually from the MCDUs by the FMGCs via internal relays of the onside RMPs. The RMP is thus transparent to the onside FMGC. In case of failure of one FMGC, the onside navigation systems are tuned directly by the remaining FMGC.

CFDIU

The BITE functions of the system are available through the Centralized Fault Display System (CFDS).

LGCIU

In order to increment the fault memories in case of Centralized Fault Display Interface Unit (CFDIU) failure, each RMP receives a discrete giving the landing gear configuration. RMP 1 receives this discrete from Landing Gear Control and Interface Unit (LGCIU) 1, and RMP 2 and 3 from LGCIU 2.

RMP FAILURE

The system architecture gives access to all communication functions in case of failure of any RMP. A RMP failure is indicated by the blanking of the display windows. If a failure occurs, the failed RMP has to be switched off. When selected off, the RMP sends a discrete signal for system reconfiguration.

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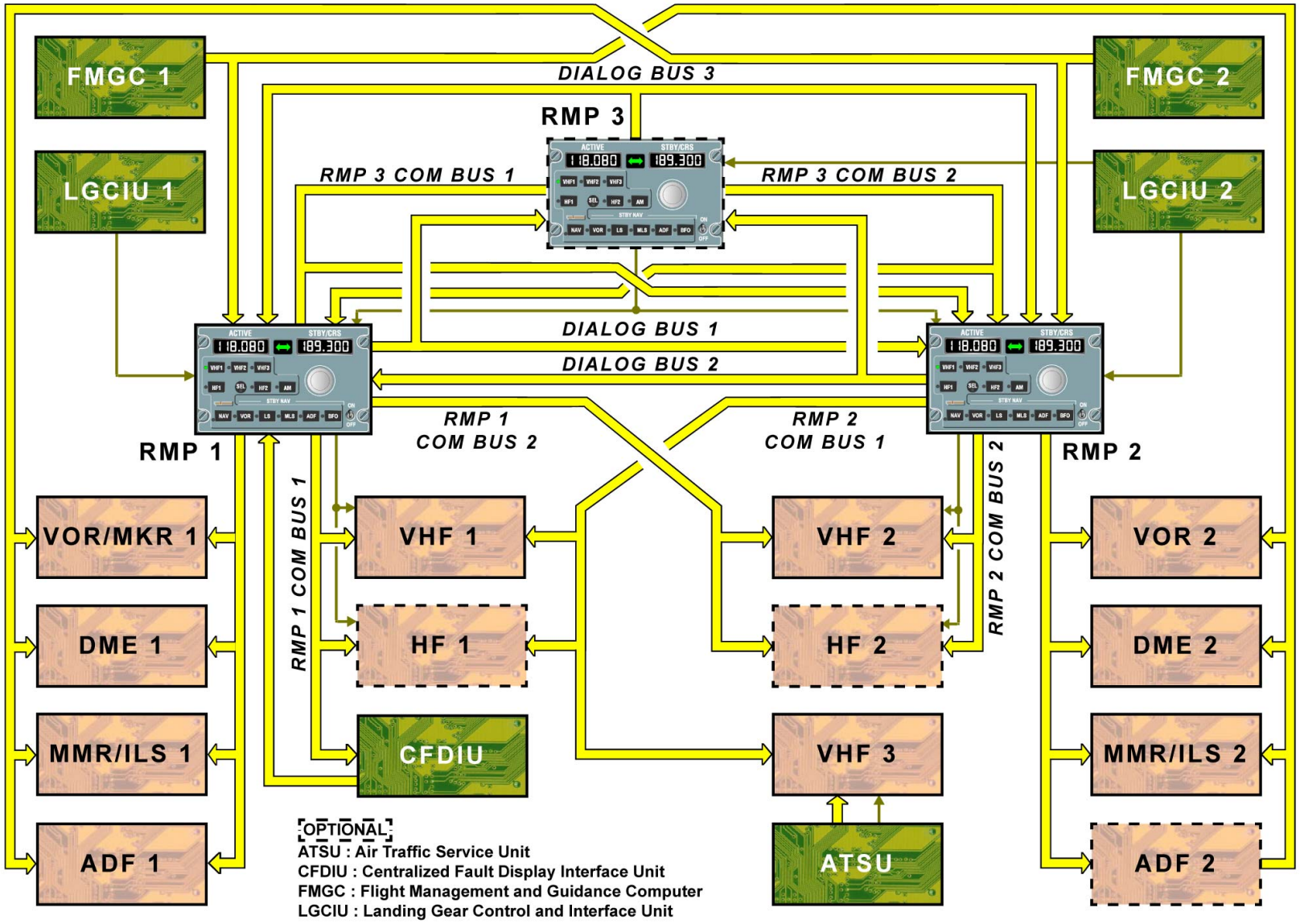

RADIO ... RMP FAILURE

AUDIO SWITCHING D/O (3)

INTRODUCTION

The AUDIO SWITCHING selector is used in case of communication failure on CAPT or F/O channels.

NOTE: Two relays controlled by the AUDIO SWITCHING selector let save the audio equipment functions in case of DC essential loss.

NORM POSITION

This position agrees with the normal allocation of the Audio Control Panels (ACPs).

CAPT 3 POSITION

In this position, the CAPT will use the 3rd occupant ACP. The 3rd occupant audio equipment cannot be used.

NOTE: The message "AUDIO 3 XFRD" is displayed in green on the ECAM MEMO display.

F/O 3 POSITION

In this selector position, the F/O is switched on the 3rd occupant ACP. The 3rd occupant Audio equipment cannot be used.

NOTE: The message "AUDIO 3 XFRD" is displayed in green on the ECAM MEMO display.

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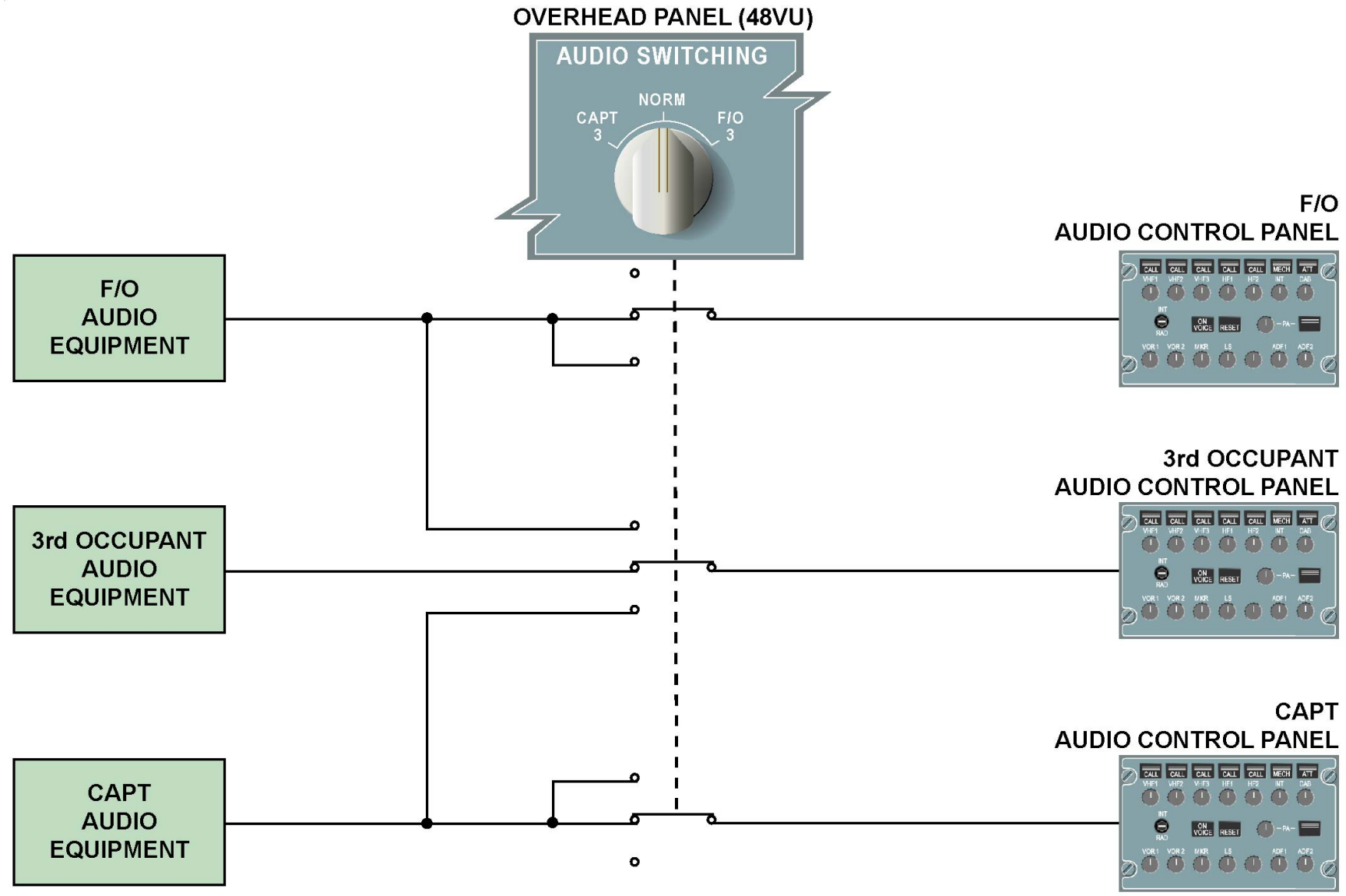

INTRODUCTION ... F/O 3 POSITION

AUDIO MANAGEMENT UNIT INTERFACES (3)

ACP-AMU LINK

Three to five identical Audio Control Panels (ACPs) can be installed. They are linked by an ARINC 429 bus to the related audio cards installed in the Audio Management Unit (AMU). ACP-AMU link is done by ARINC 429 buses. Only digital data are exchanged between the AMU and the ACPs. There are no audio signals inside the ACPs.

AMU LAYOUT

Various functions such as switching, filtering and amplification are done inside the AMU. The AMU includes several identical audio processing cards, one for each ACP.

VOLUME CONTROL

The volume control function is achieved by digital transmission of the knobs position to the AMU. Volume control is achieved inside the AMU.

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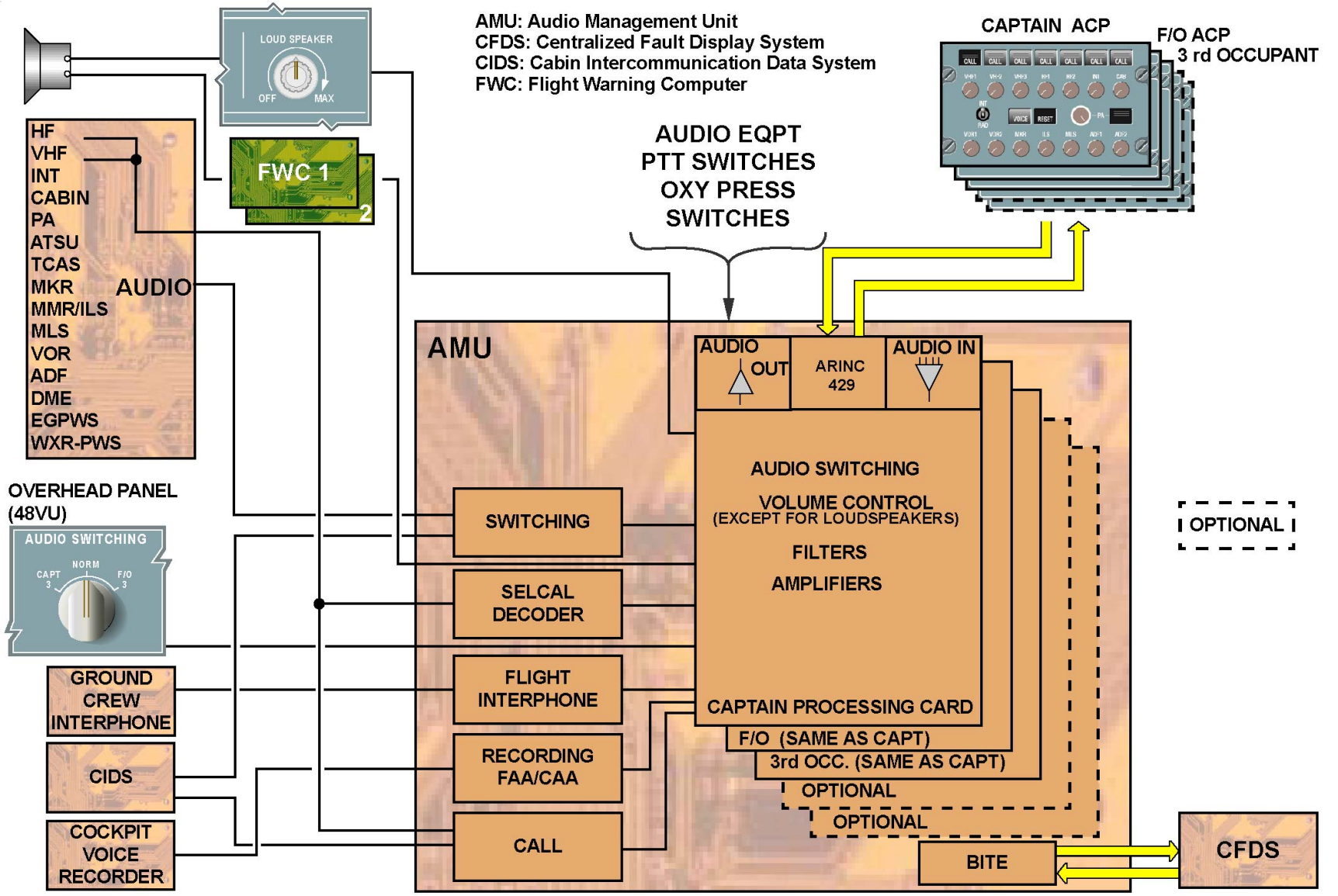

ACP-AMU LINK ... VOLUME CONTROL

COCKPIT LOUDSPEAKER MUTING CIRCUIT D/O (3)

MUTING CIRCUIT

Each crew station, CAPT, F/O and 3rd occupant, has the direct muting function managed by the Audio Management Unit (AMU). A muting circuit is installed to avoid acoustic coupling between the loudspeakers and the microphones. When a transmission is keyed by any push to talk switch, a ground signal is delivered to the two loudspeaker amplifiers. This ground signal decreases the gain and band-pass of the loudspeaker amplifiers.

NOTE: This attenuating circuit is not operative with the Flight Warning Computer (FWC) audio outputs.

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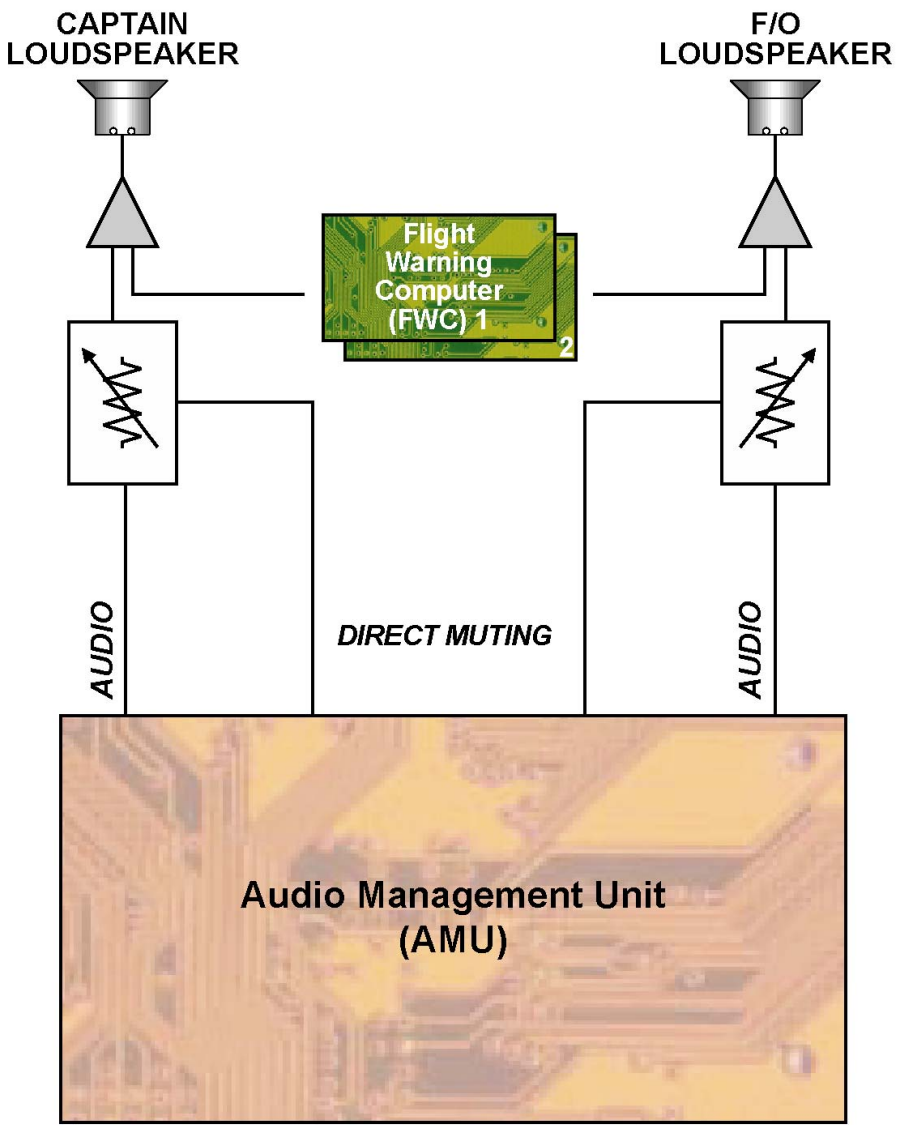

MUTING CIRCUIT

HF SYSTEM ARCHITECTURE D/O (3)

HF TRANSCEIVER

The High Frequency (HF) system serves for all long-distance voice communications between different aircraft in flight or on the ground, or between the aircraft and one or several ground stations.

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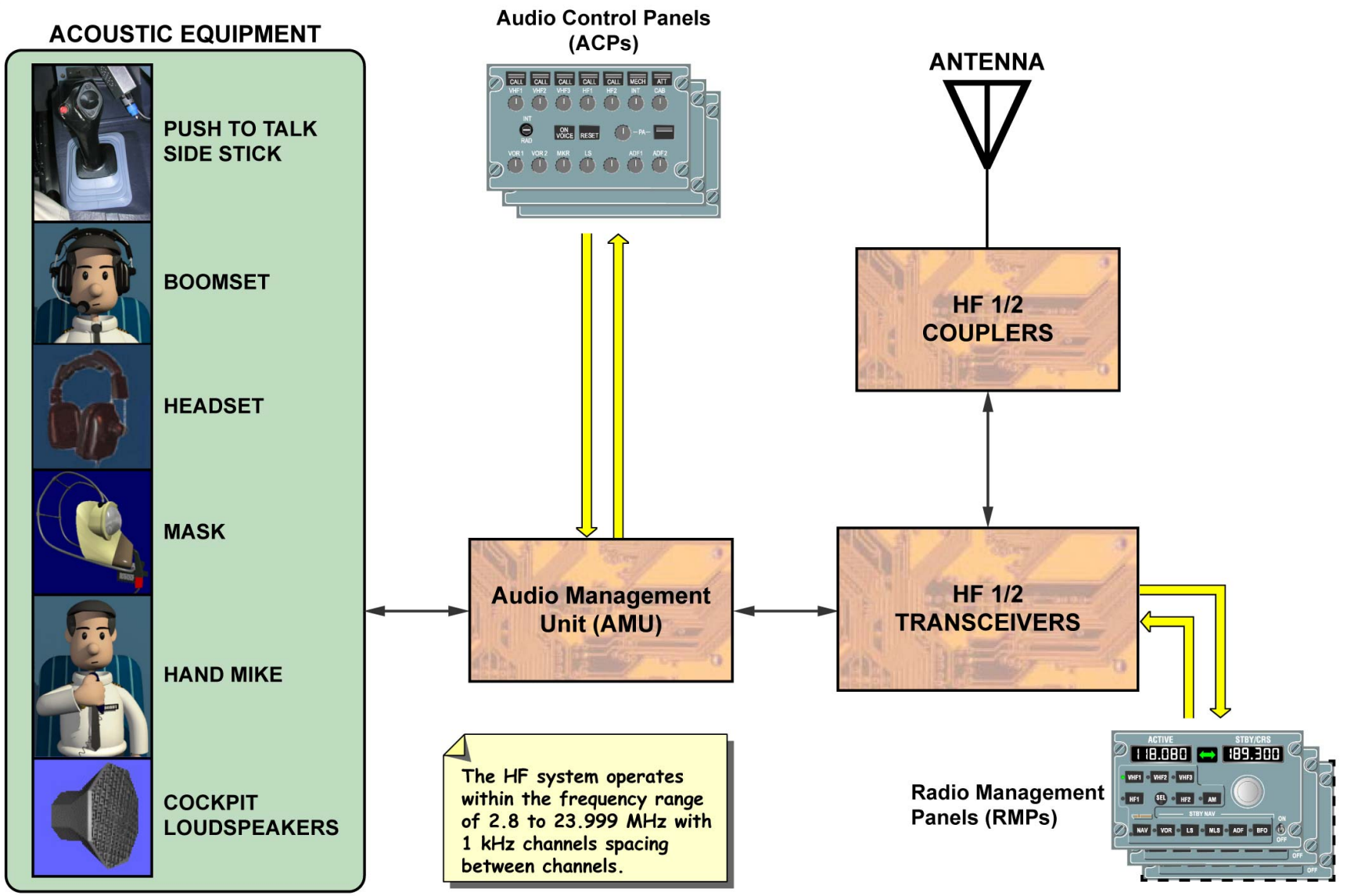

HF TRANSCEIVER

HF SYSTEM ARCHITECTURE D/O (3)

RMP

The Radio Management Panel (RMP) controls the tuning operations which are transmitted to the transceiver (XCVR) by a numeric message in compliance with ARINC 429. This message can be received by the port A or the port B of the XCVR. The RMP does this selection by a discrete. The message can be made of one word of 32 bits or two words of 32 bits for the 1KHz or 100 Hz spacing (pin prog). A microprocessor does the decoding of the frequency selected and mode: Upper Side Band (USB) or Amplitude Modulation (AM).

SDAC

The connection between the HF XCVR and the System Data Acquisition Concentrator (SDAC) lets the use of the HF system in transmission mode be recorded. The connection is obtained through the Push To Talk (PTT) switch. In case of continuous emitting during more than one minute, the ECAM displays in amber: COM: HF 1/2 EMITTING.

AMU

The HF system is linked to the Audio Management Unit (AMU) for connection to the audio integrating and SELective CALling system. The Audio Control Panels (ACPs) are used for HF transmission or reception selection mode and control of the received audio signal levels through the AMU.

LGCIU

The Landing Gear Control and Interface Unit (LGCIU) indicates the flight or ground status of the aircraft. This information is used by the HF BITE, in order to count the flight legs in case of Centralized Fault Display Interface Unit failure (CFDIU).

CFDS

For maintenance purposes, BITE is integrated in the HF XCVR. The BITE functions of the HF XCVR are monitored by the Centralized Fault Display System (CFDS).

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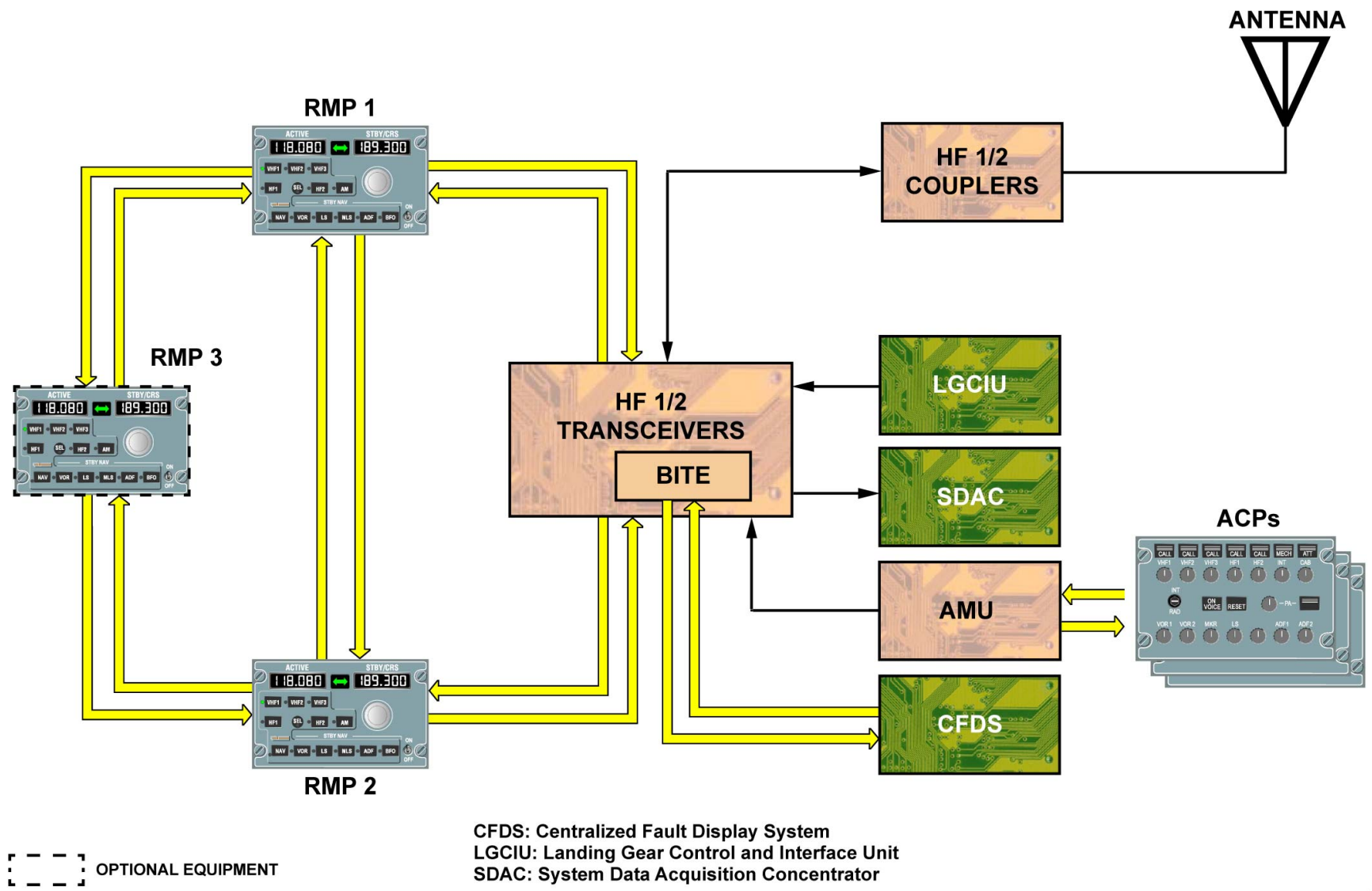
ANTENNA
RMP 1
HF 1/2
COUPLERS
RMP 3
HF 1/2
TRANSCEIVERS
BITE
LGCIU
SDAC
AMU
CFDS
ACPs
RMP 2
OPTIONAL EQUIPMENT
CFDS: Centralized Fault Display System
LGCIU: Landing Gear Control and Interface Unit
SDAC: System Data Acquisition Concentrator

RMP ... CFDS

VHF SYSTEM D/O (3)

VHF TRANSCEIVER

The Very High Frequency (VHF) system is used for all short-range voice communications between different aircraft in flight or between the aircraft and ground stations. Optionally, aircraft can have the VHF Data Link (VDL) system, to communicate via the data mode, in addition to the voice mode.

RMP

The Radio Management Panels (RMPs) are used for VHF frequency control and display. The VHF transceiver has 2 serial input ports : Serial input port A for normal use and serial input port B in case of RMP failure. The port selection is done through the discrete port selection information signal. The selected frequency information sent to the VHF system is a serial 32 bit word. The VHF requires one serial 32 bit word for complete tuning data.

SDAC

The System Data Acquisition Concentrator (SDAC) acquires the VHF Push To Talk (PTT) signal and sends this information to the ECAM and the Digital Flight Data Recorder (DFDR). In case of continuous emitting, the ECAM displays:
- COM: VHF 1/2 EMITTING.

AMU

The VHF system is linked to the Audio Management Unit (AMU) for connection to the audio integrating and SELective CALling (SELCAL) systems. The Audio Control Panels (ACPs) are used for VHF transmission or reception selection mode and control of the received audio signal levels through the AMU.

LGCIU

The Landing Gear Control and Interface Unit (LGCIU) indicates the flight or ground aircraft status. This information is used by the VHF BITE, in order to count the flight legs in case of Centralized Fault Display Interface Unit (CFDIU) failure.

CFDS

For maintenance purposes, a BITE is integrated in the VHF transceiver. The BITE functions of the VHF transceiver are monitored by the Centralized Fault Display System (CFDS).

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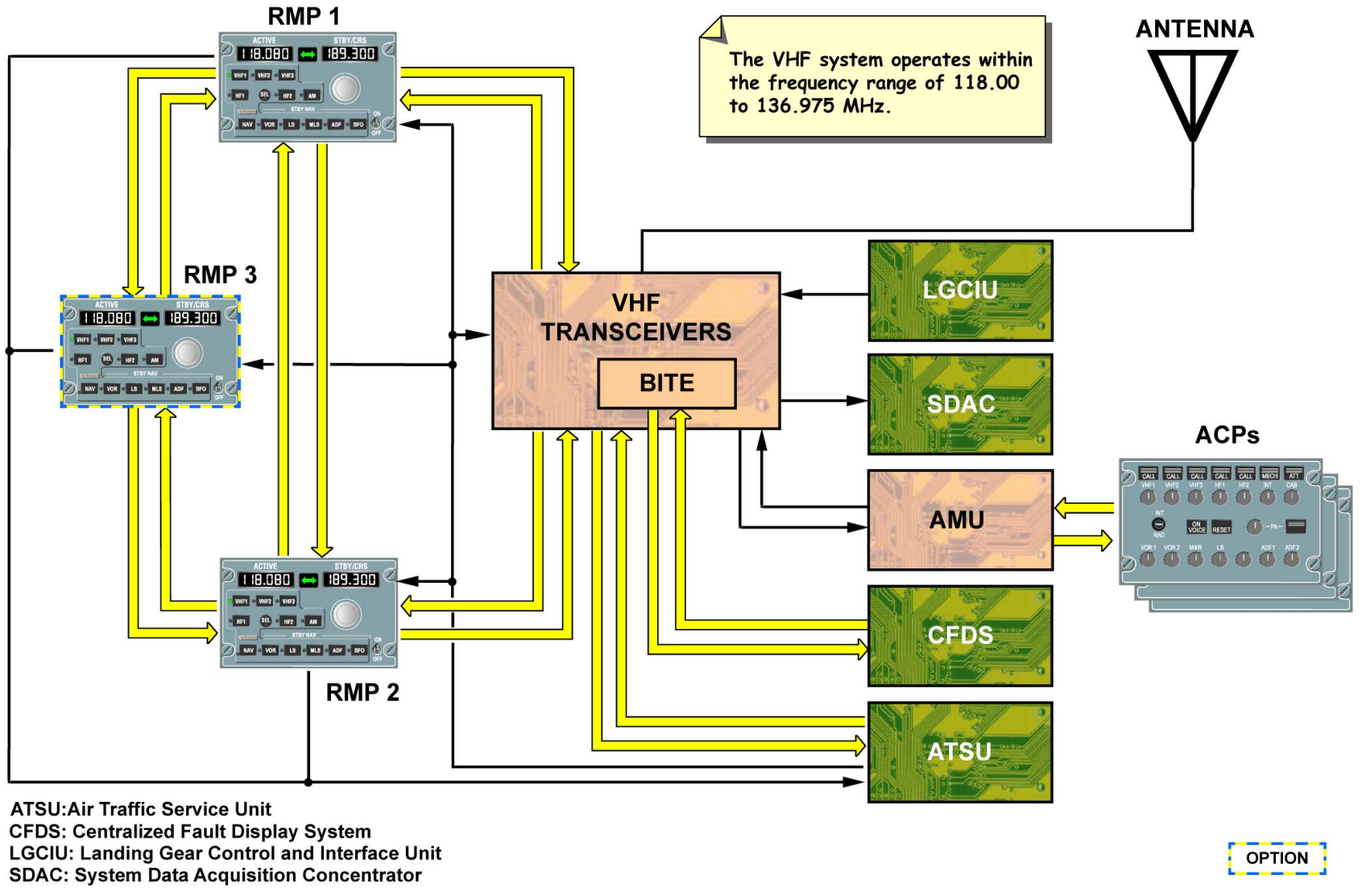

VHF TRANSCEIVER ... CFDS

SELCAL AND COCKPIT CALL SYSTEM D/O (3)

GENERAL

The SELective CALling (SELCAL) and CALL functions are done in the Audio Management Unit (AMU) by the SELCAL/CALL card. This card receives SELCAL calls from the ground stations via the communication channels, a SELCAL code from the SELCAL code panel, calls from the ground crew and the attendant stations and sends visual and aural warnings.

SELCAL OPERATION

The SELCAL/CALL card has 7 inputs connected to the communication receiver SELCAL outputs. These inputs are permanently scanned, and when a SELCAL signal is present, a comparison is made with the code programmed on the SELCAL code panel. When the 2 codes agree, a message is sent to the various Audio Control Panels (ACPs), via the corresponding audio cards. On the ACPs, the CALL light, corresponding to the communication channel used, flashes amber. At the same time, data is sent to the Flight Warning Computers (FWCs). The FWCs send an audio call buzzer to the loudspeakers. The call is cancelled using the RESET key on one ACP, or selecting the called channel and activating the Push To Talk (PTT).

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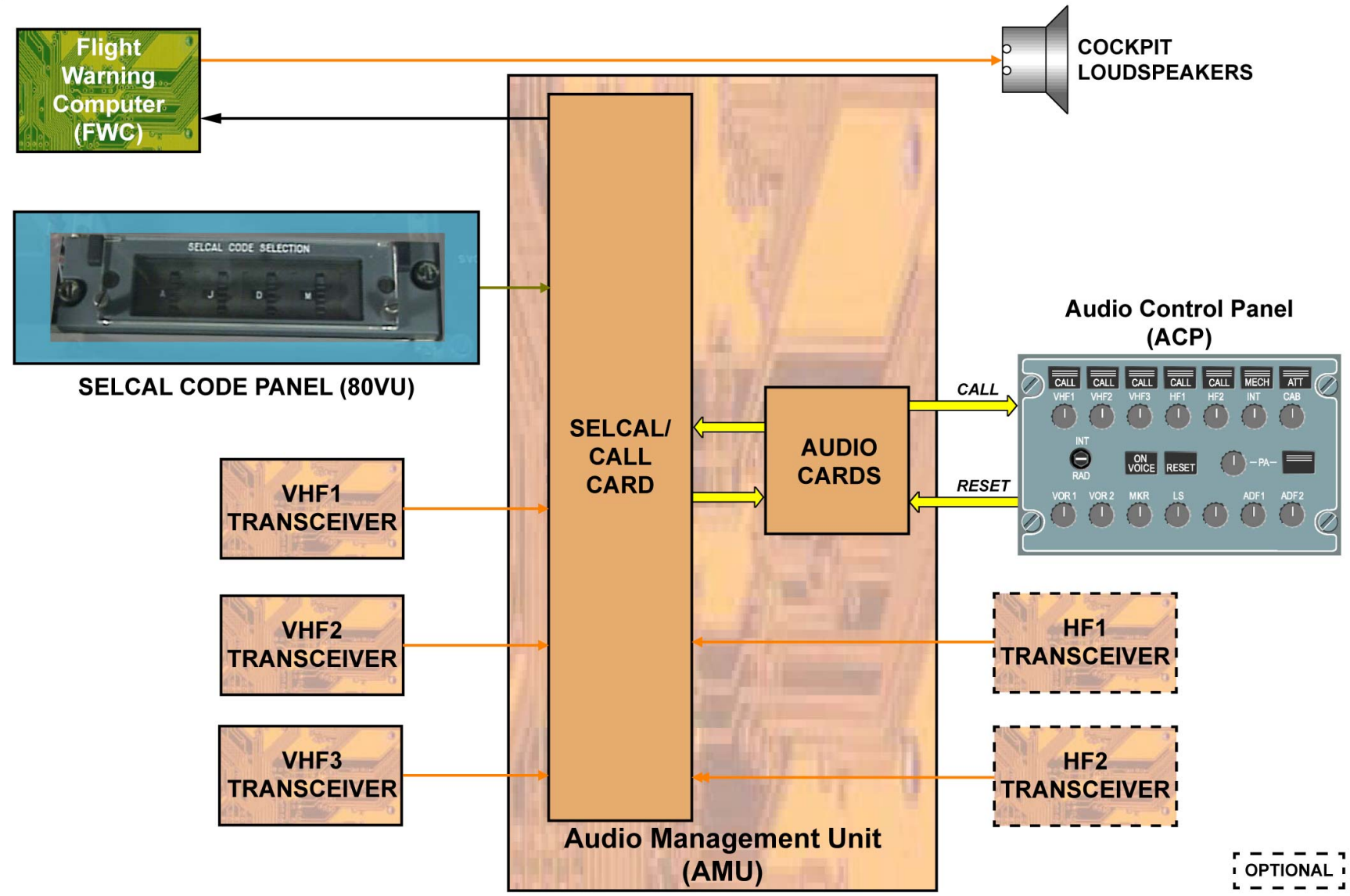

GENERAL & SELCAL OPERATION

SELCAL AND COCKPIT CALL SYSTEM D/O (3)

GROUND CALL

Two types of calls may be received by the SELCAL/CALL card:
- ground call and,
- cabin attendant call.

When the cockpit call pushbutton, located on the external power control panel, is pressed, ground information is sent to the SELCAL/CALL card and to the FWC. The FWC activates the buzzer signal through the loudspeakers. The SELCAL card sends a signal through the various audio cards to the ACPs. The MECHanical legend flashes amber for 60 seconds on the ACPs. The visual call is automatically cancelled and the circuit reinitialized after 60 seconds or when the RESET pushbutton is pressed in, on any ACP. The automatic reset may be cancelled with the AMU pin programming.

ATTENDANT CALL

When a call is made from a cabin attendant station, the Cabin Intercommunication Data System (CIDS) generates ground information to the SELCAL/CALL card and to the FWC. During one second, the FWC activates the buzzer signal through the loudspeakers. The SELCAL/CALL card sends a signal through the various audio cards to the ACPs. The ATTendant legend flashes for 60 seconds on the ACPs. The visual call is automatically cancelled and the circuit reinitialized after 60 seconds or when the RESET pushbutton is pressed in, on any ACP. Information is also sent to the CIDS for re-initialization. The automatic reset may be cancelled with the AMU pin programming.

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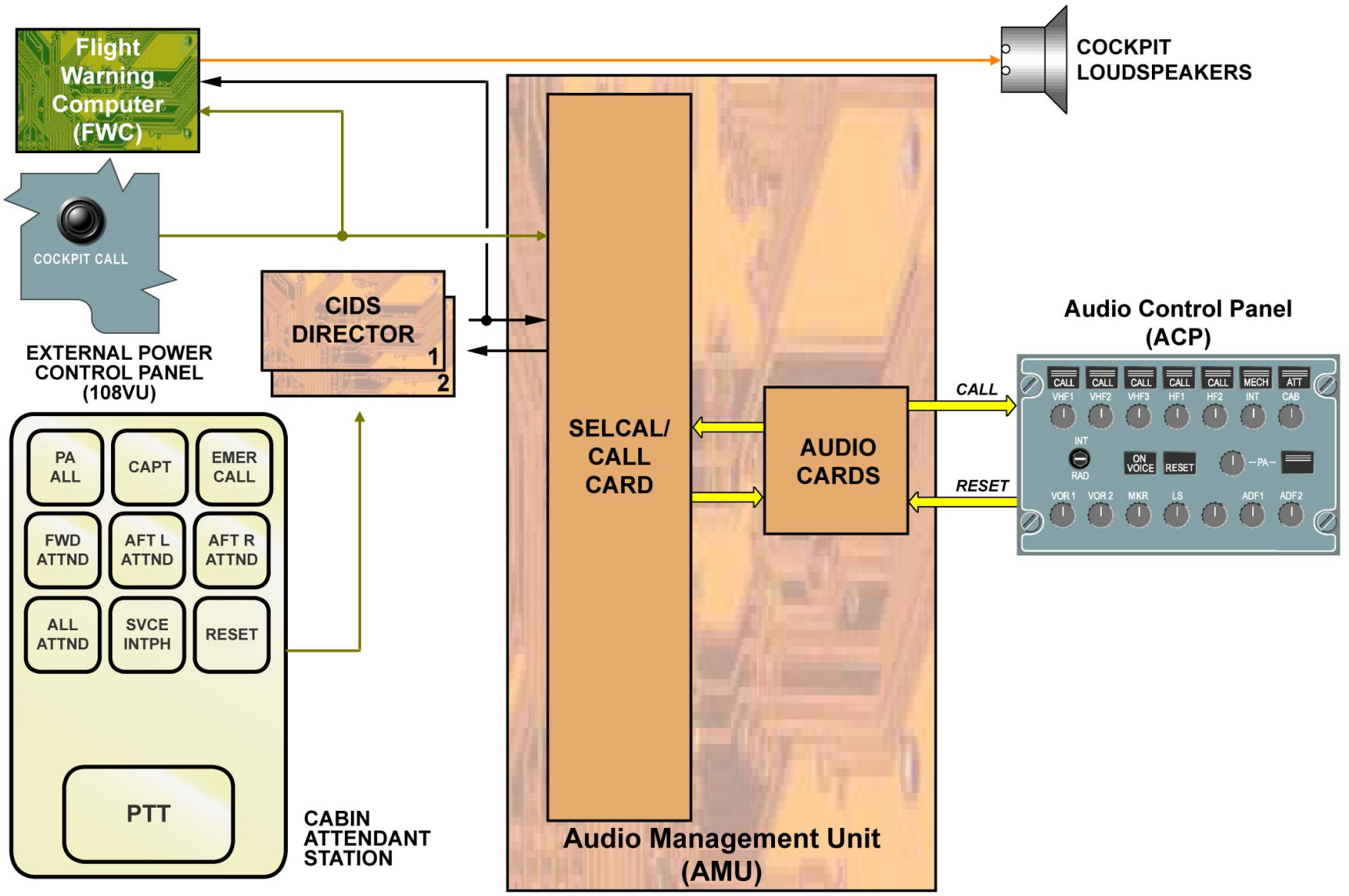


GROUND CALL & ATTENDANT CALL

STATIC DISCHARGING PRESENTATION (2)

PURPOSE

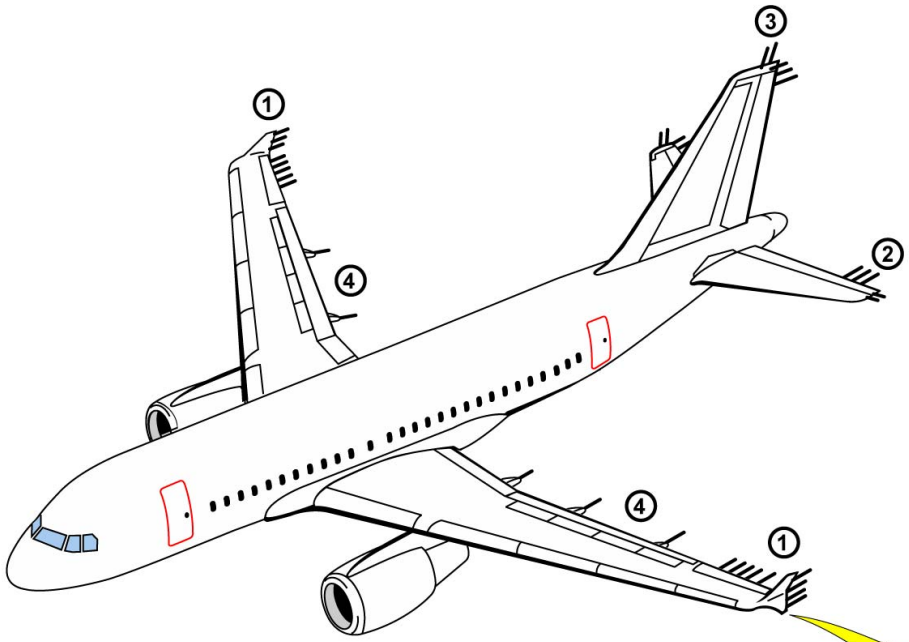
The aircraft behaves like a Faraday cage and should be discharged. The static dischargers avoid static electricity discharging noise and ensure a good quality of radio transmission, without interference. The purpose of the static dischargers is:
- to discharge the static electricity accumulated by the aircraft during its flight,
- to supply better intelligibility on the HF and VHF system (avoid static electricity discharge noise).

PURPOSE

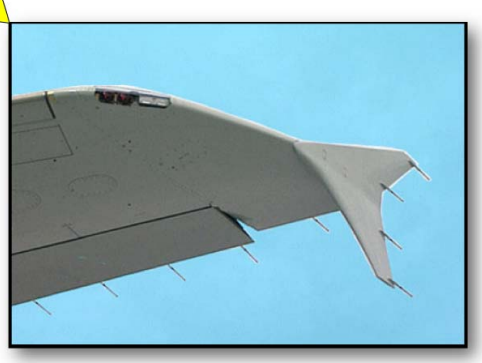
STATIC DISCHARGING PRESENTATION (2)

LOCALIZATION OF THE STATIC DISCHARGERS

The disposition of the static dischargers is used for the dispatch of the static electricity. They are located around the aircraft extremities.



LOCATION	QTY	REMARKS
Wing tip and aileron. (1)	9 per wing.	2 may be missing on each wing.
Horizontal stabilizer tip zone. (2)	5 per side.	1 may be missing on each side.
Fin and Rudder. (3)	5.	1 may be missing.
Flap track fairing (4)	3 per wing.	1 may be missing on each wing.



STATIC DISCHARGERS

LOCALIZATION OF THE STATIC DISCHARGERS

STATIC DISCHARGING PRESENTATION (2)

STATIC DISCHARGERS INSTALLATION

If the aircraft has been struck by lightning the static dischargers are the first elements destroyed and they can be easily replaced. Two kinds of static dischargers are installed, depending on their localization on the aircraft:
- one with a straight mounting installed at the trailing edges,
- one with a 30 degree angle mounting, installed at the tips.

Two types of retainer are installed:
- a flat retainer at the trailing edges,
- an angular retainer at the tips.

The two types are not interchangeable.

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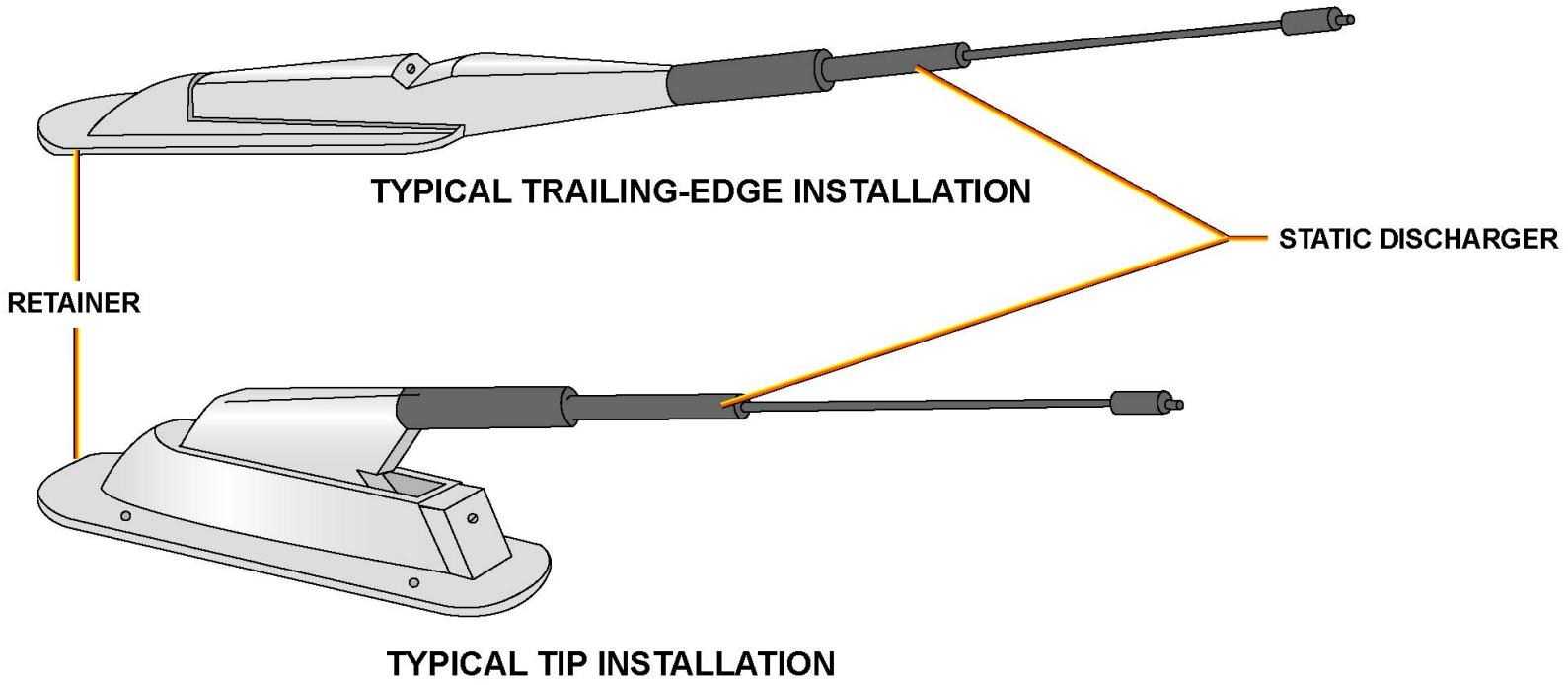


STATIC DISCHARGERS INSTALLATION

SATCOM D/O (3)

SATCOM PRESENTATION

The function of the SATCOM system is the reception and processing of signals via satellites to supply aeronautical services in the L-Band. Aero-H+-HSD SATCOM lets the aircraft fly in the spot beam coverage to transmit and receive multichannel voice, fax, e-mail and circuit mode data services. Packet mode data services and emergency calls are available world-wide in the global beam. The system Aero-H+-HSD SATCOM includes:
- a Satellite Data Unit (SDU),
- a High Speed Data Unit (HSDU), a second HSDU is optional,
- a splitter,
- an attenuator,
- a High Gain Antenna (HGA).

The SDU is the interface to other aircraft systems. It contains all data processing functions. It also contains the modems, channel tuning synthesizers, high-stability reference oscillator, to/from intermediate frequency to/from L-band conversion and the High Power Amplifier (HPA) used to amplify the SDU-generated L-band signal to a power level necessary for correct transmission to the satellite.

SDU

The SDU is the primary system of the SATCOM system. It does most of the data-handling, protocol, modulation/coding and demodulation/decoding functions of the Aircraft Earth Station (AES).
The SDU is connected to:
- the Air Data/Inertial Reference System (ADIRS) to send the relative azimuth and relative elevation command to the Beam Steering Unit (BSU) to point the steerable beam of the HGA for best reception and transmission,
- the Centralized Fault Display Interface Unit (CFDIU) for BITE,
- the Air Traffic Service Unit (ATSU) when the VHF link with ground station is not possible,
- the Cabin Telecommunication Unit (CTU) for the cabin/passenger telecommunications equipment to get the best performance from the resources supplied by the SATCOM,
- the MCDUs to display call status information and system configuration information for the SDU,
- the Multipurpose Disk Drive Unit (MDDU) installed on the pedestal and used to up/download software,
- the Flight Warning Computer (FWC), to send warnings and cautions during the flight,
- the Audio Management Unit (AMU) to make audio transmission (the calls are started with the related SATCOM channel SAT 1 or SAT 2 transmission key on the Audio Control Panel (ACP)),
- the Landing Gear Control and Interface Unit (LGCIU) to transmit air/ground information discrete outputs.

The RF signal is sent to the HPA through an attenuator and it is received from the Diplexer/Low Noise Amplifier (D/LNA).

HSDU

The HSDU supplies one channel at a maximum data rate of 64 kb/s. The HSDU gives two communication services (also known as Swift64):
- the Mobile-Integrated Services Digital Network (M-ISDN) for communications charged by minutes of connection,
- the Mobile Packet Data Services (MPDS) for communications charged by the number of bits transmitted.

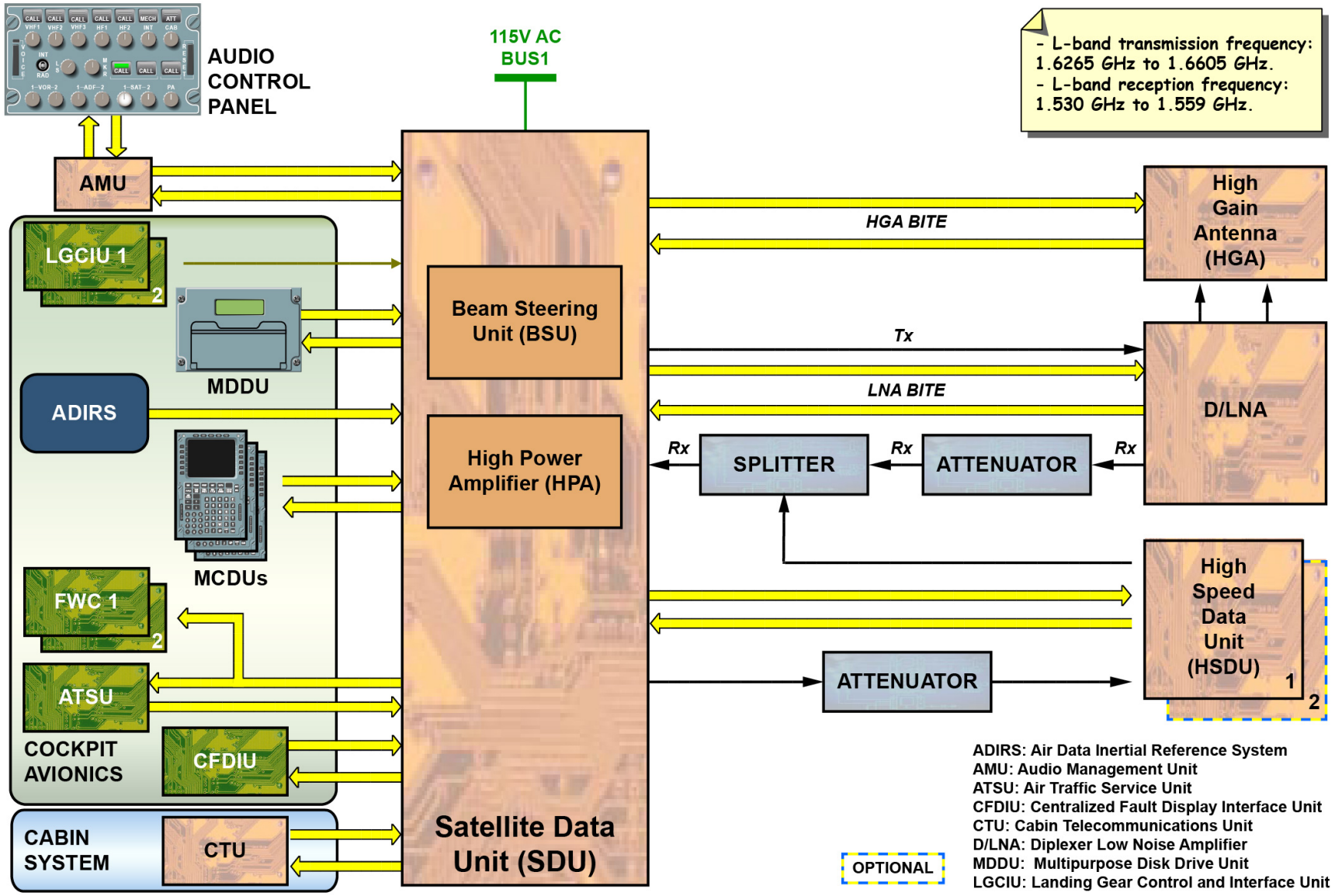
HGA

The high gain antenna is an electronically steerable phased array. Simultaneous transmission and reception of satellite signals (full duplex operation) supplies two bands of operation: receive (Rx) band and transmit (Tx) band.
Beam steering of the antenna is done via serial transmission of phase shifter data from the D/LNA unit.

The HGA supplies +12 dBic nominal gain with near hemispherical coverage and can be used for the transmission of high-rate data and voice communications.

A SATCOM antenna subsystem includes these components:

- a D/LNA which supplies the first stage of amplification and filtering before the signals are sent to the SDU in reception mode,
- a splitter,
- an attenuator,
- a HGA (installed on top).



SATCOM PRESENTATION - SDU ... HGA

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SATCOM D/O (3)

BITE

With the CFDS, the SATCOM system faults can be displayed on the MCDU and can be printed on the printer.
The CFDIU has two operating modes:
- normal mode: during the normal mode, the BITE monitors the status of the SATCOM cards in cycles and transmits this data to the CFDIU during the flight. If a fault is detected, the BITE stores the information in the fault memory,
- menu mode: this mode is used for communication between the CFDIU and the SATCOM BITE through the MCDU. The BITE test can only be started on the ground.

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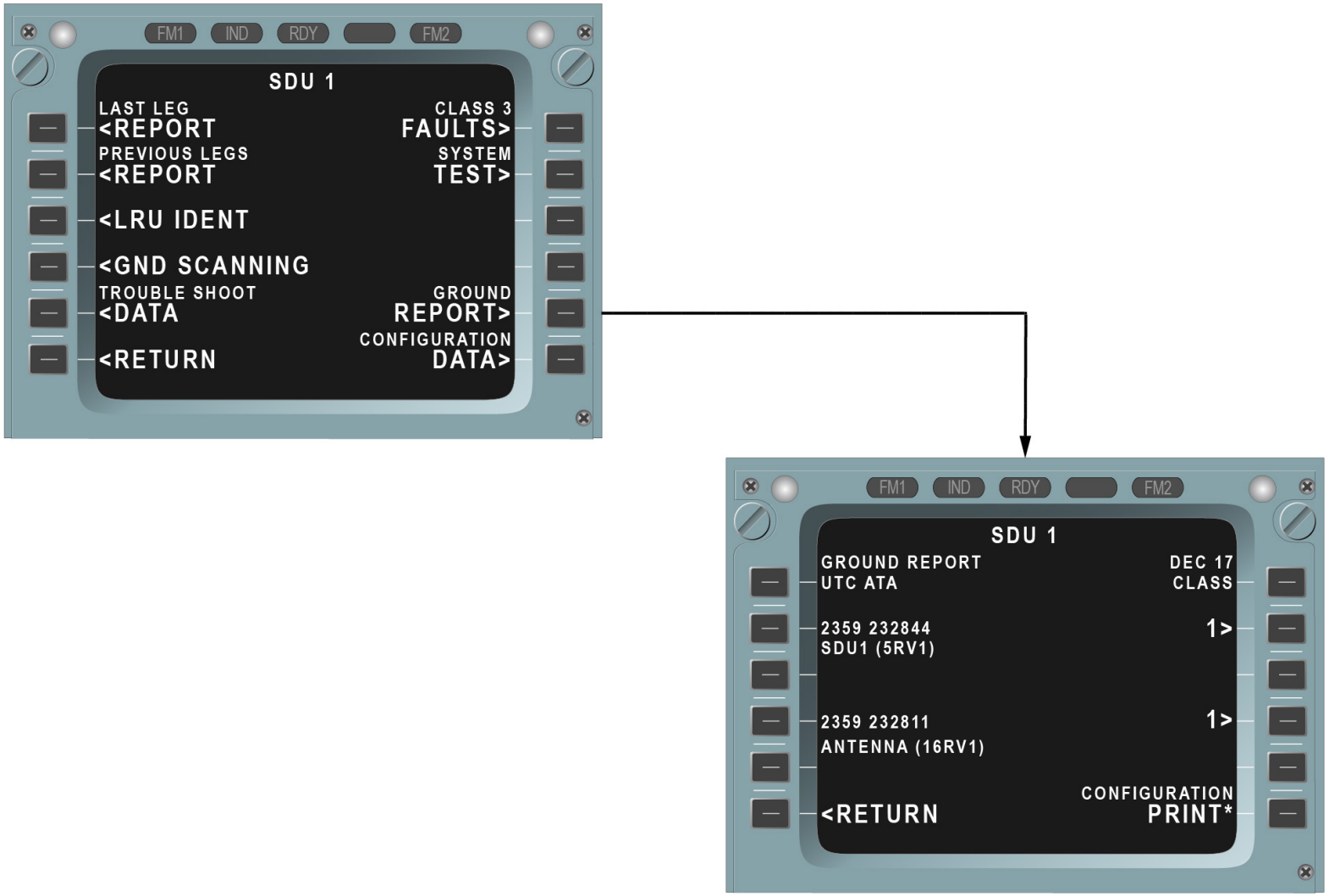
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1>
CONFIGURATION
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PRINT*

BITE

CVR OPERATIONAL MODES D/O (3)

NORMAL MODE

The A/C has a Solid State CVR (SSCVR) which records into a memory block unit. In normal mode, the CVR records, on four independent channels, the audio signals from the CAPT, F/O and 3rd occupant through the Audio Management Unit (AMU). Channel 4 records the ambient noise picked up by the area microphone and supplied through a pre-amplifier to the CVR. The CVR is automatically supplied when the aircraft is in one of the configurations given below:
- in flight with engines in operation or stopped,
- on the ground with one engine or more in operation,
- on the ground during the first five minutes after energization of the aircraft electrical network,
- on the ground until a maximum of five minutes after the second engine shutdown.

The CVR is qualified in 115VAC and 28VDC power supply and it can thus be installed on aircraft that obey European Aviation Safety Agency (EASA) regulation (115VAC) or Federal Aviation Administration (FAA) regulation (28VDC).

NOTE: The CVR can be supplied manually. To do this, push the ReCorDeR/GrouND ConTroL P/BSW.

ERASE MODE

SOLID STATE CVR

The RCDR CVR ERASE P/B must be pressed for a minimum of 0.5 s to activate the erase function. Once activated, this function disables the ability to download the previously recorded data from the Crash Survivable Memory Unit (CSMU) using the normal download function. A 400 Hz tone is sent through the audio monitor to indicate a successful erase. Erase is only possible, aircraft on the ground, R and L main landing gear shock absorbers compressed and parking brake applied.

NOTE: If the engines are shut down, the CVR must first be energized by pressing the GND CTL P/B on the RCDR panel.

TEST MODE

SOLID STATE CVR

The Push-to-Test function is activated using a discrete input of the SSCVR (activated using a pushbutton RCDR/CVR TEST switch 5RK installed on the overhead panel). The discrete must be activated for a minimum of five seconds to activate this function. Once activated, this function has an extensive set of functional tests to determine the integrity of the system. A successful self-test results in the status discrete output being activated once. This results in the activation of the status LED (whichever is shown) on the SSCVR. In addition to the visual indication, an aural indication is given through the audio monitor output received at the CVR/HEAD SET JACK (on the maintenance panel 50VU). Or, at the two loud speakers a 600 Hz tone is sent to indicate successful self-test. A 800 Hz tone is sent to the headset jack and the loud speakers for aural indication.

NOTE: Prior to this test, the CVR must be energized by pressing the GND CTL P/B with the engines not running.

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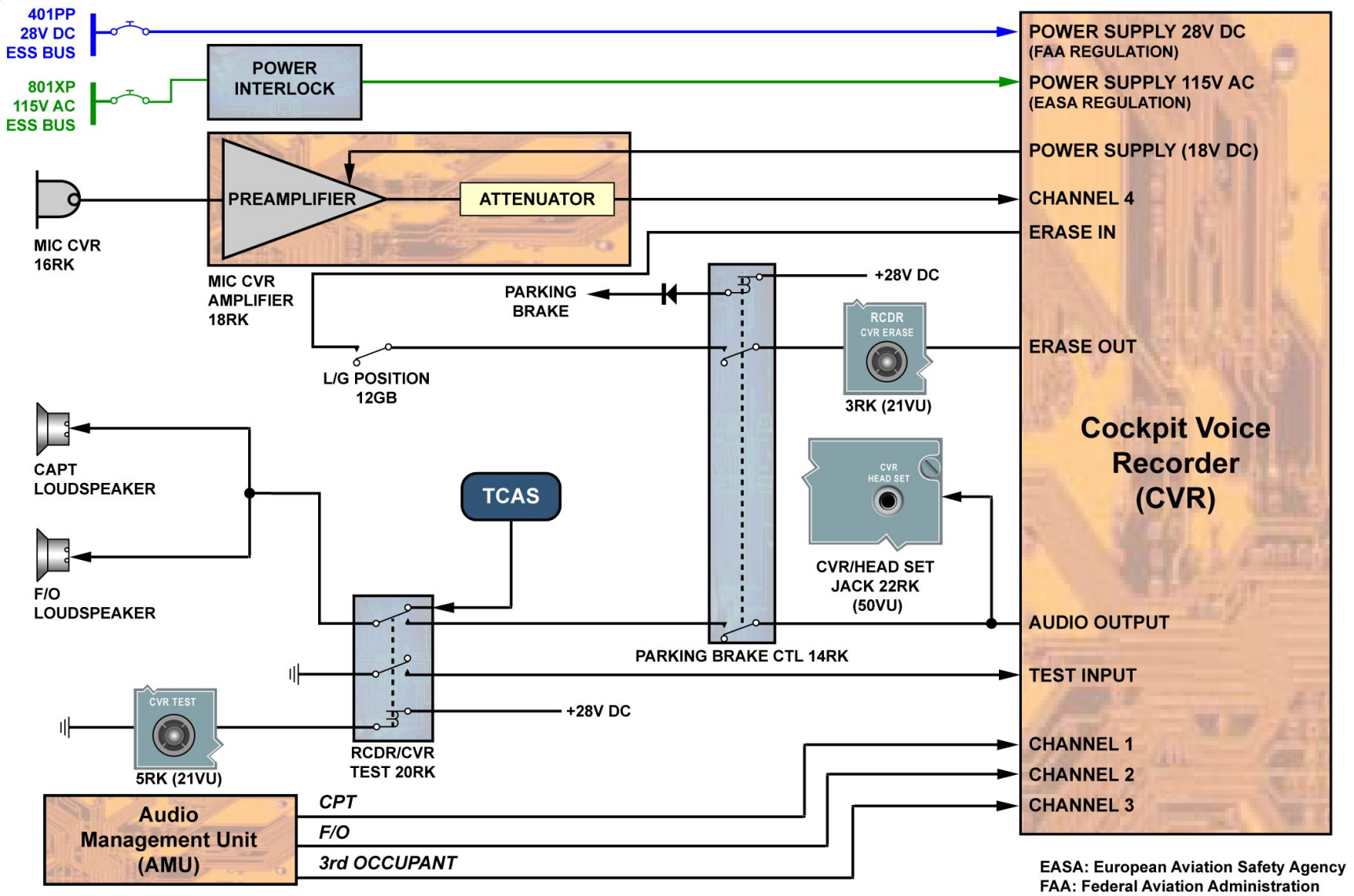

NORMAL MODE ... TEST MODE

CVR OPERATIONAL MODES D/O (3)

INDICATING AND RECORDING SYSTEMS/CVR INTERFACE

The CVR has interfaces with the Centralized Fault Display Interface Unit (CFDIU), the Air Traffic Service Unit (ATSU) and the Clock to make the data link recording function available.

FAA/CAA OPTION

A jumper strap installed on the AMU enables Federal Aviation Administration (FAA) /Civil Aviation Authority (CAA) recording selection. In FAA mode, all the communications heard by the crewmembers are recorded. This is obtained by the recording of side-tone signal: Audio output. This lets, at the same time record all the communications sent out by these crewmembers. In CAA mode, the CAPT, F/O, 3rd occupant boomset microphones are "HOT " at all times for voice/noise pick-up to reinforce the sounds picked-up by the area mike. The mask microphones circuits are open until the oxygen pressure switch is closed. The hand microphones are only "HOT" when the Push-To-Talk (PTT) switch on the microphone is activated. However, in CAA mode, as in FAA mode, the signal received in the crew's earphones is recorded on the CVR.

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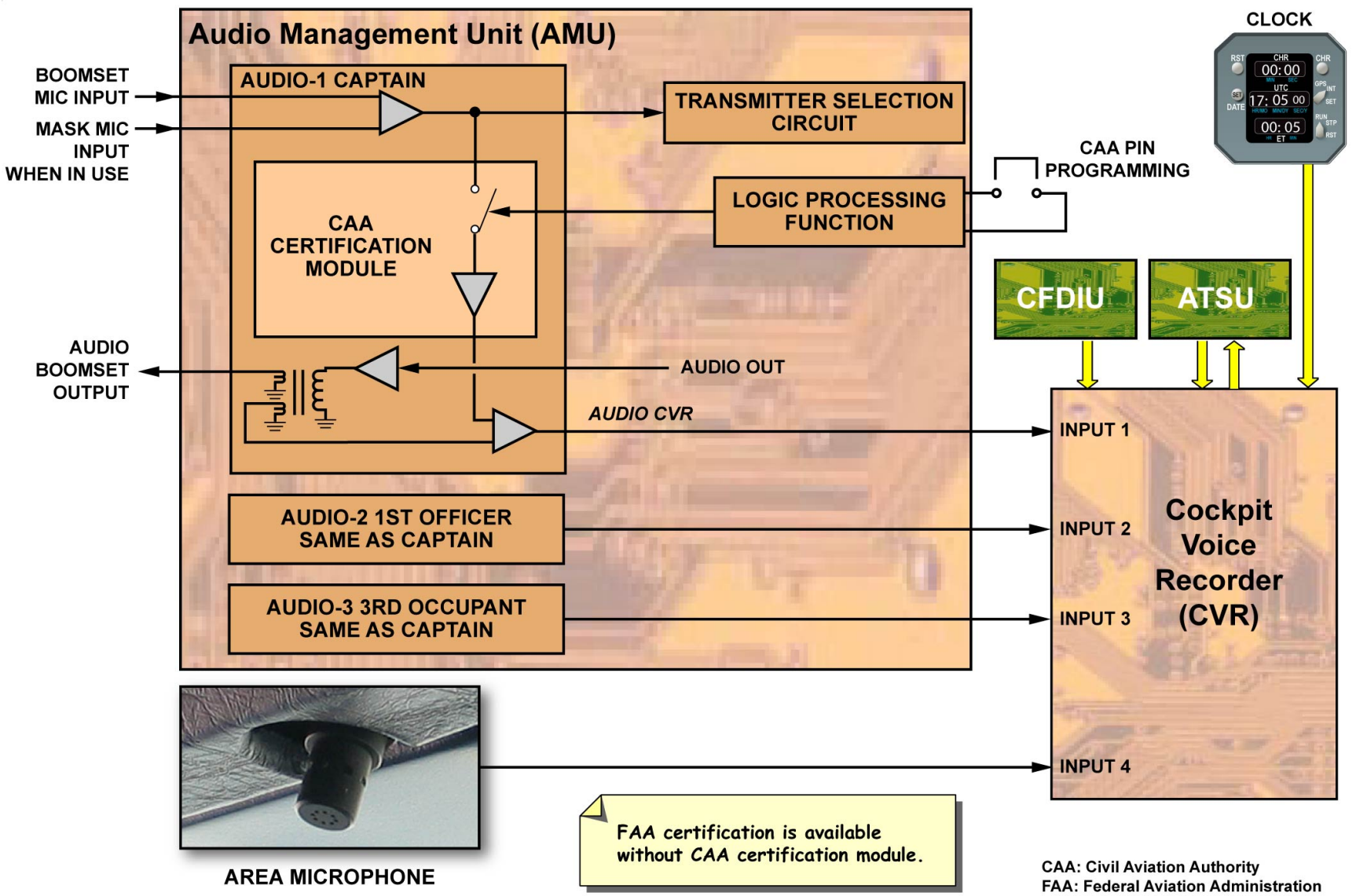


INDICATING AND RECORDING SYSTEMS/CVR INTERFACE & FAA/CAA OPTION

EMERGENCY LOCATOR TRANSMITTER SYSTEM D/O (3)

GENERAL

The Emergency Locator Transmitter (ELT) function is to transmit distress signals. The ELT system transmits on 3 frequencies: 121.5 MHz (Civil) and 243 MHz (Military) homing-signals, and 406 MHz to the COSPAS-SARSAT satellite system. The battery-pack, installed in the ELT housing, supplies the power to operate the system. The satellite system transmits the 406 MHz distress signal to a Local User Terminal (LUT), when the LUT is in range. The LUT receiving range is a radius of approximately 2.500 km (1367.00 NM). When the LUT is not in receiving range, the satellite system stores the distress signal until transmission is possible. The LUT automatically processes the distress signal to identify and show the position of the aircraft to a radius of approximately 1.8 km (5900 ft). The processed data is transmitted to a Mission Control Center (MCC). The MCC sends the data to an applicable Rescue Coordination Center (RCC), where Search And Rescue (SAR) operations are started. The 121.5 MHz and 243 MHz signals are used to find the aircraft in the final stage of SAR operation.

ELT DESCRIPTION

The ELT system includes these components:
- An ELT,
- An Aircraft Identification Module (AIM),
- A Remote Control Panel (RCP),
- An antenna, installed on the upper external fuselage between FRame 64 and FR65,
- An indicator,
- A horn.

EMERGENCY LOCATOR TRANSMITTER

The ELT is installed with bolts, washers and nuts on a support bracket, and the interface points in flight direction. The ELT has an aluminum alloy housing which includes these components:
- An electronic unit,
- A battery pack,
- An interface,
- A connector.

The electronic unit and the battery-pack are kept in the housing. The electronic unit has two different G-switches installed (North American and European). The battery-pack is made of five lithium batteries connected together. You can get access to the battery-pack through a cover on the attachment side of the ELT. The cover is installed with screws. The interface includes:
- An ARM/OFF/TX switch,
- An antenna connector,
- An RCP connector,
- An indicator.

The connector is installed on the back end of the ELT (against flight direction), and connects directly to the AIM. The RCP connector is used to connect an RCP, or a Beacon Message Programmer (BMP). The ELT is programmable to one of the five approved protocols:
- Serialized Aviation User Protocol,
- Aviation User Protocol,
- 24 bit Aircraft Address Number,
- Aircraft Operator Designator Number and Serial Number,
- Serial Number Protocol.

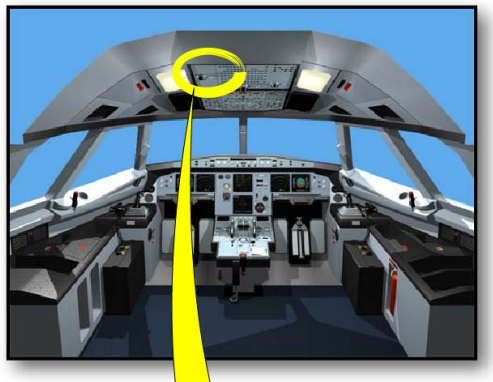
AIRCRAFT IDENTIFICATION MODULE

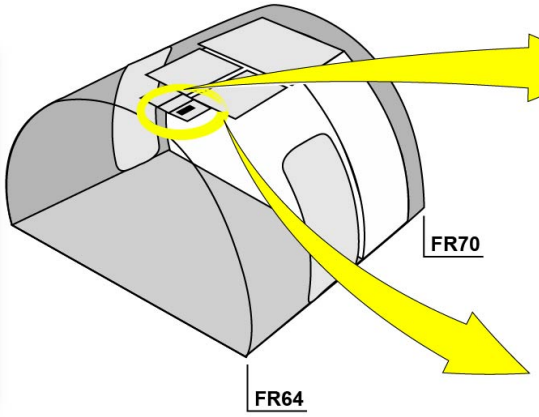
The AIM is installed on the same support bracket as the ELT, and is held in position with bolts, washers and nuts. It is connected directly to the ELT connector and has a connector on the rear side for connection to a BMP.

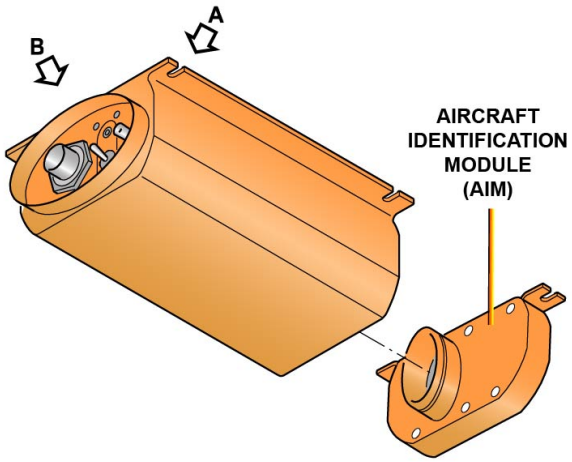
REMOTE CONTROL PANEL

The RCP is installed on the cockpit overhead-panel and held in position with two captive screws. It is an enclosed box with a lighted front panel. The front panel has an ON-ARMED-TEST/RESET switch

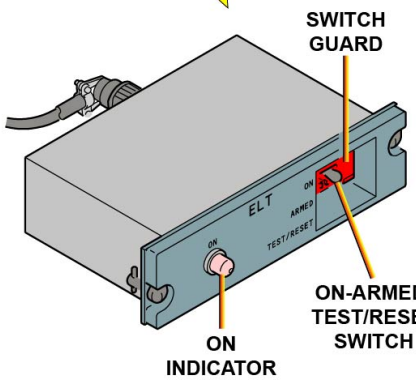
and an ON indicator. The ON-ARMED-TEST/RESET switch has a switch guard. The back panel has an identification placard and a 19-pin connector to connect the RCP to the ELT.



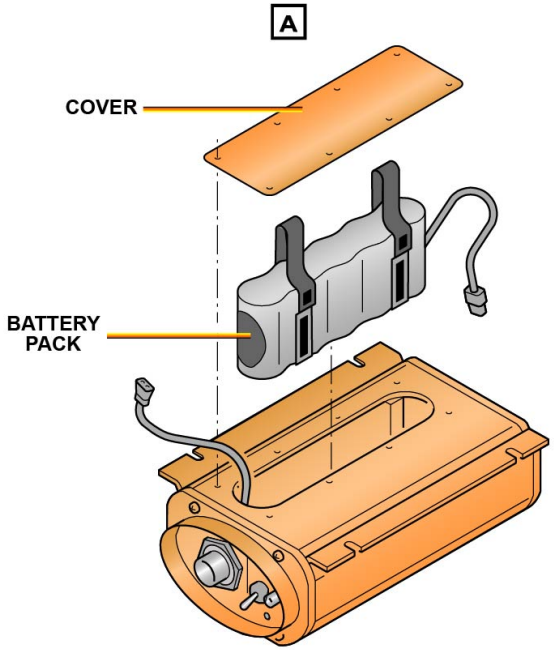


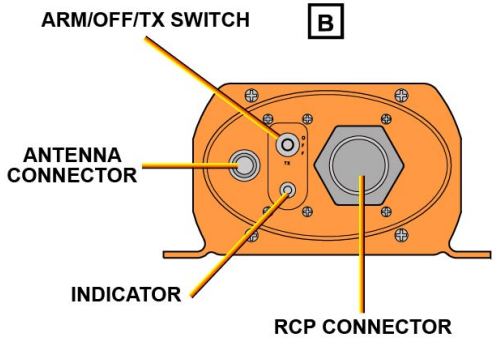


EMERGENCY LOCATOR TRANSMITTER



REMOTE CONTROL PANEL (RCP) (20VU)





GENERAL & ELT DESCRIPTION

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EMERGENCY LOCATOR TRANSMITTER SYSTEM D/O (3)

ELT OPERATION

EMERGENCY LOCATOR TRANSMITTER

The ELT operates automatically or manually. The battery-pack supplies the power to operate the ELT.
The signal transmission can continue for approximately fifty hours.
The three-position switch controls three modes:
- OFF mode: there is no power available from the battery-pack and the ELT circuits are not energized. The ELT cannot detect a crash or transmit rescue signals. You cannot operate a BITE test in this mode,
- ARMED mode: the necessary circuits are energized and the ELT can detect a start signal from the G-switch, the RCP or the ELT ARM/OFF/TX switch. After the signal is received, the ELT switches to transmit mode. You can operate a BITE test in this mode. There are 3 different types of operation in the armed mode:
- Automatic operation occurs when the G-switch detects an impact sufficient to start the transmit mode,
- Manual operation occurs when you need to transmit a signal (aircraft out of operation, injured passengers/crew members), or when you do a BITE test,
- Accidental operation occurs when the ELT is connected to its system in the A/C and the G-switch starts transmission without a real emergency (hard landing).
- Transmit mode: the ELT starts to transmit 121.5/243 MHz and 406 MHz signals to the antenna.

AIRCRAFT IDENTIFICATION MODULE

The AIM automatically programs the 406 MHz message in the ELT with one of the different message protocols. During an ELT BITE test the AIM transmits this aircraft identification code to the ELT. After the data transfer occurs the AIM verifies that the data was transmitted correctly. You can also program the AIM with a NULL message that will not reprogram the ELT.

REMOTE CONTROL PANEL

The RCP operates the ELT from a different location in the aircraft.
The RCP can:
- Manually start ELT operation (if the ELT ARM/OFF/TX switch is set to the ARMED position),
- Reset ELT operation to the ARMED mode (this is not applicable when the ELT ARM/OFF/TX switch is set to the TX position),
- Start and monitor a BITE test.
The ON-ARMED-TEST/RESET switch has these functions:
- Set to the ON position for manual operation of the ELT. You must lift the switch guard to set the switch to the ON position,
- Set to the ARMED position for automatic operation of the ELT. The switch is kept in the ARMED position by a switch guard. The switch guard stops accidental operation of the ELT,
- Set to the TEST/RESET position to start an ELT BITE test, or to reset ELT operation to the ARMED mode. Set the switch to the TEST/RESET position for not longer than 2 seconds to start a BITE test.
The ON indicator comes on when the ELT operates, or to give the BITE test result. During ELT transmission the indicator slowly flashes continuously.

BITE TEST

This BITE test can be done with the RCP or the ELT.
On the RCP:
- Set the ON-ARMED-TEST/RESET switch to the TEST/RESET position for not longer than two seconds, then back to the ARMED position,
- The indicator flashes two times,
- An emergency signal can be heard on the 121.5 MHz frequency, at the cockpit loudspeaker.
On the ELT:

- Set the ARM/OFF/TX switch to the OFF position and then back to the ARM position,
- The indicator flashes two times,
- An emergency signal can be heard on the 121.5 MHz frequency, at the cockpit loudspeaker.

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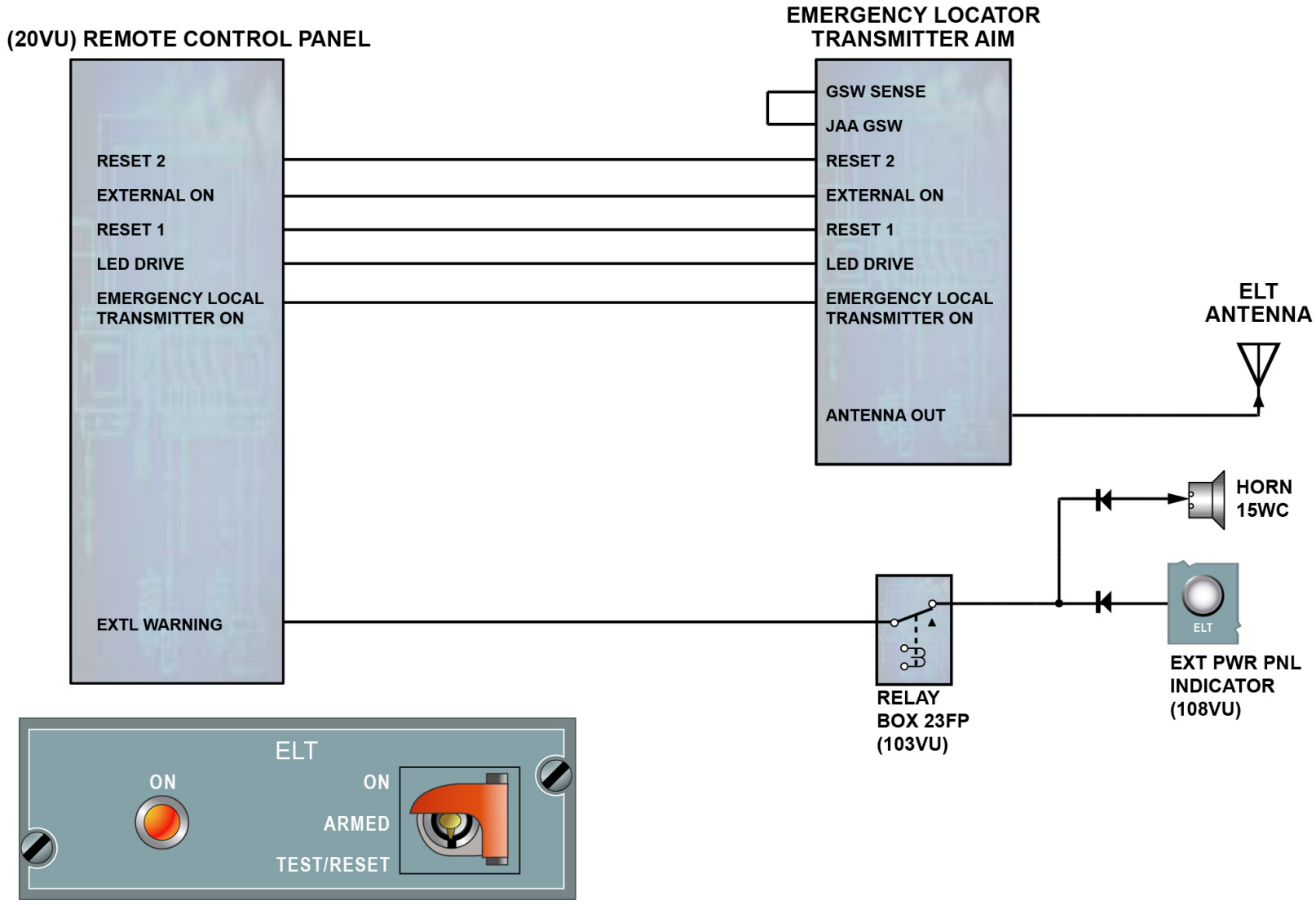

ELT OPERATION & BITE TEST

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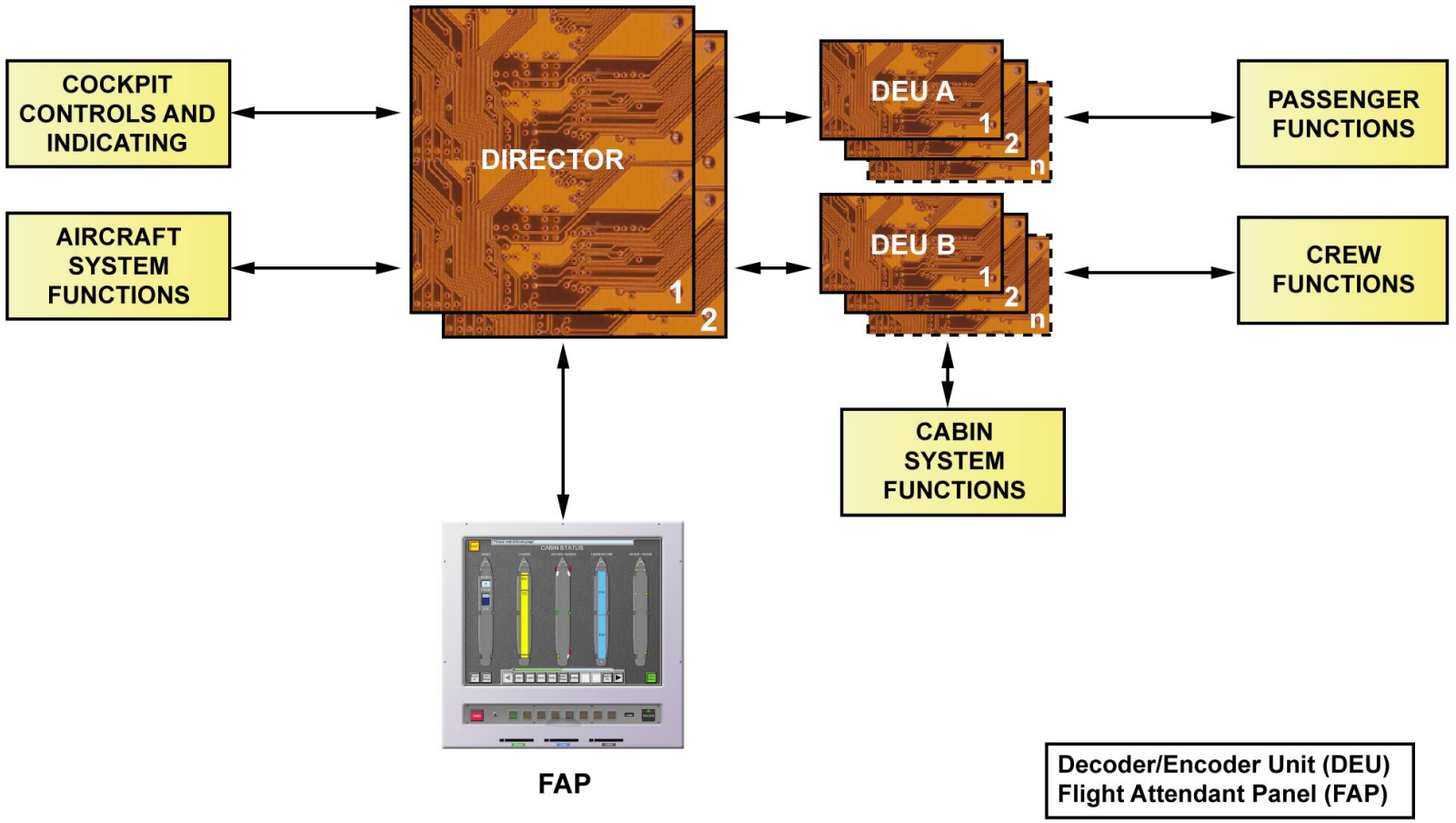
CIDS COMPONENT LOCATION (2)

CABIN INTERCOMMUNICATION DATA SYSTEM OVERVIEW

The Cabin Intercommunication Data System (CIDS) is used for the control and management of cabin systems.
The CIDS includes two directors, a touch-screen Flight Attendant Panel (FAP) and Decoder/Encoder Units (DEU). The touch-screen FAP controls and shows the status of the CIDS. The Cabin Assignment Module (CAM), the On-Board Replaceable Module (OBRM) and the Prerecorded Announcement and Music (PRAM) flash cards are integrated in the FAP.



CABIN INTERCOMMUNICATION DATA SYSTEM OVERVIEW

CIDS COMPONENT LOCATION (2)

COMPONENT LOCATION

CIDS DIRECTORS

Directors 1 and 2 are installed in avionics rack 80 VU.

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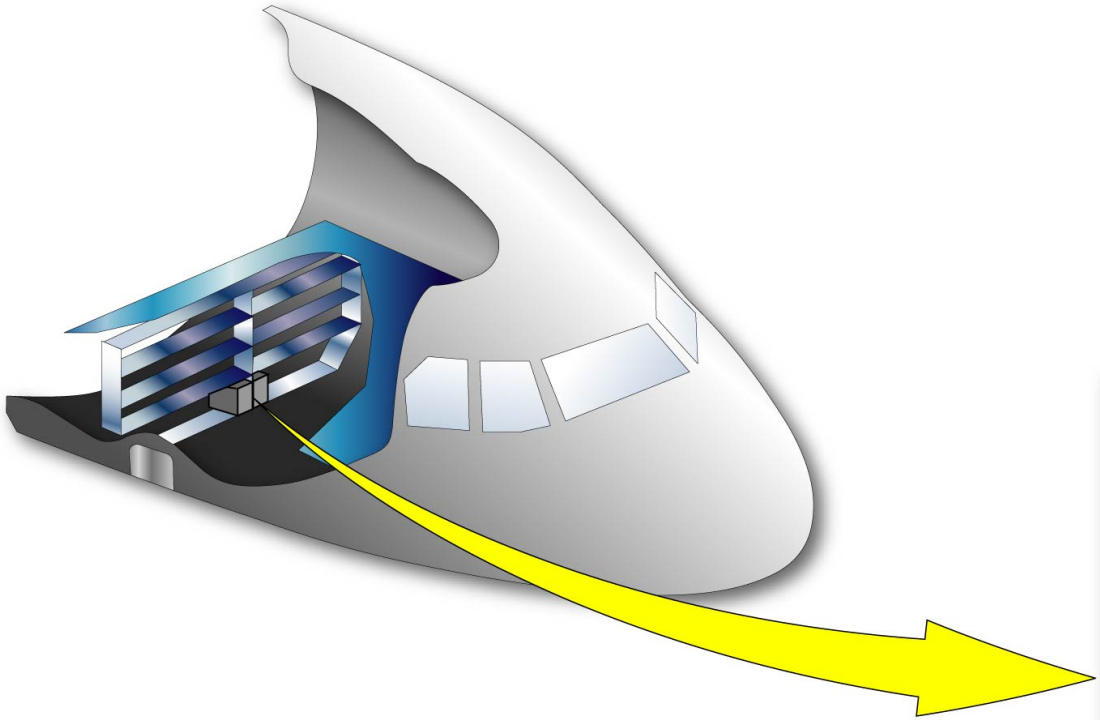


CIDS DIRECTOR 1 AND 2

Cabin Intercommunication Data System (CIDS)

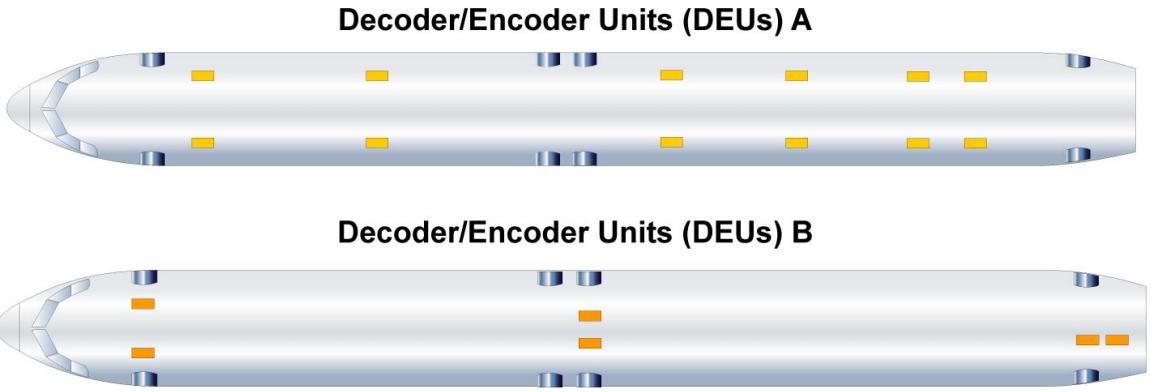
COMPONENT LOCATION - CIDS DIRECTORS

CIDS COMPONENT LOCATION (2)

COMPONENT LOCATION (continued)

DECODER/ENCODER UNITS

DEUs type A and B are installed behind the ceiling panels. The number of DEUs installed can change in relation to the fuselage length and the configuration of passenger entertainment systems. On the A321 for example, a maximum of 17 DEU-As and 8 DEU-Bs can be installed. DEUs type A are not interchangeable with DEUs type B.



COMPONENT LOCATION - DECODER/ENCODER UNITS

CIDS DIRECTOR/DEU ARCHITECTURE (3)

GENERAL

The Cabin Intercommunication Data System (CIDS) includes:
- the central control components, the DIRectors,
- the main user interface, the Flight Attendant Panel (FAP),
- and the data interfaces, the Decoder/Encoder Units (DEUs).

The cabin interphone and some Passenger Address (PA) audio are transmitted in a bi-directional way via the Audio Management Unit (AMU) between the cockpit and the DIRs. The cockpit handset is directly linked to the DIRs via 1 discrete signal and 2 analog signals. The touch screen FAP controls and indicates the status of the CIDS. The PRerecorded Announcement and Music (PRAM), Cabin Assignment Module (CAM) and On Board Replaceable Module (OBRM) flash cards are integrated into the FAP.

DEU A

Maximum of sixteen type A DEUs are installed above the windows in the cabin ceiling and close to the center ceiling for the DEUs in the entrance area. Each DEU type A is controlled by the active DIR. The DEUs type A are connected to one of the two data-bus top lines (i.e. : two wire twisted and shielded cable). A broken wire in one top-line bus will only affect the type A DEUs behind the crack on this bus. The type A DEUs of the other top-line bus will work without disturbance.

PASSENGER SIGNS

The passenger signs; equipped with Light Emitting Diode (LED) technology; include NO SMOKING or the optional NO ELECTRONIC DEVICE lights, FASTEN SEAT BELT lights, NON SMOKER ZONE lights and RETURN TO SEAT lights in the lavatories. Furthermore, for the passenger call system, the seat row lights are connected to the type A DEUs.

CABIN LIGHTS

The cabin lights include:
- entrance, windows & ceiling lights,
- lavatory lights, equipped with LED technology and fluorescent lamp,
- attendant lights, equipped with LED technology,
- reading lights, equipped with LED technology.

LOUDSPEAKERS

The loudspeakers are linked to the Passenger Interface Supply Adapters (PISAs) installed in the Passenger Service Units (PSUs), and directly connected to DEUs A and stand alone PISAs, close to the attendant station and in each lavatory. They are all identical and are used for:
- passenger address announcements,
- call chimes (optional).

NOTE: One PISA is installed in each PSU.

PASSENGER CALL

Pushbuttons are fitted in the PSUs above each seat row and in the lavatories.

READING/LIGHT

Reading lights are supplied by the active CIDS DIR via type A DEUs and PISAs.

ATTENDANT LIGHT

Attendant lights are supplied by the active CIDS DIR via type A DEUs and the stand alone PISAs.

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DEU B

A maximum of 8 type B DEUs are installed near the exit doors in the center ceiling. They are connected to the DIRs via a middle line data bus. DEU B location may vary with specific airline requirements.

SLIDE PRESSURE SYSTEM

The DIRs receive signals from the bottle pressure sensors via type B DEUs. If the pressure is low, the message CHECK SLIDE PRESSURE is displayed on the located zone of the DOORS/SLIDES page on the FAP.

DOOR PRESSURE SYSTEM

The DIRs receive signals from the bottle pressure sensors via type B DEUs. If the pressure is low, the message CHECK DOOR PRESSURE is displayed on the located zone of the DOORS/SLIDES page on the FAP.

CREW INTERPHONE SYSTEM

The cabin crew interphones are linked to the type B DEUs via 1 discrete and 2 analog audio signals.

NOTE: From each attendant station it is possible to communicate with personnel at the service interphone connections.

EPSU

The Emergency Power Supply Units (EPSUs) are connected to type B DEUs for the emergency lighting system test.

AIP

One Attendant Indication Panel (AIP) is installed near each attendant seat for message purposes.

ACP

One basic and one optional Area Call Panel (ACP), equipped with LED technology, can be connected to each DEU B.

AAP

One Additional Attendant Panel (AAP) is installed near the aft (and middle for A321) attendant stations.

SWITCH PANEL

The switch panel is installed adjacent to the middle RH and exit RH attendant station.
The switch panel has the following functions:
- Indication of the EVAC alert,
- Reset of the acoustic and visual EVAC alert indications, related to the respective attendant station,
- Reset of all acoustic and visual lavatory smoke warnings.

POTABLE & WASTE WATER SERVICE PANEL

Due to the door switch on potable or waste water service panel, the service door open information is sent to the FAP, through a discrete signal to the DEU B, and to the active DIR.

DRAIN MAST CONTROL UNIT

The DIRs receive signals from the drain mast control unit via the type B DEUs. If the drain mast heater or the control unit fails, a related message is displayed and the CAUTion light on the FAP comes on.

WASTE LIQUID LEVEL SENSOR

The Liquid Level Sensor (LLS) is installed in the upper section of the waste holding tank, it is connected electrically to the DEUs B. When the waste holding tank content level is at full, the liquid level sensor sends a discrete signal to DEUs B.

WASTE LIQUID LEVEL TRANSMITTER

The Liquid Level Transmitter (LLT) is installed in the bottom section of the waste holding tank, it is connected electrically to the DEUs B. It monitors the contents level in the waste holding tank, the liquid level transmitter sends an analog signal to DEUs B.

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FLUSH CONTROL UNIT

The Flush Control Unit (FCU) is an electronic assembly installed on the supporting frame of the toilet assembly. The unit controls the time and sequence of the toilet operation during the flush cycle.

VACUUM GENERATOR

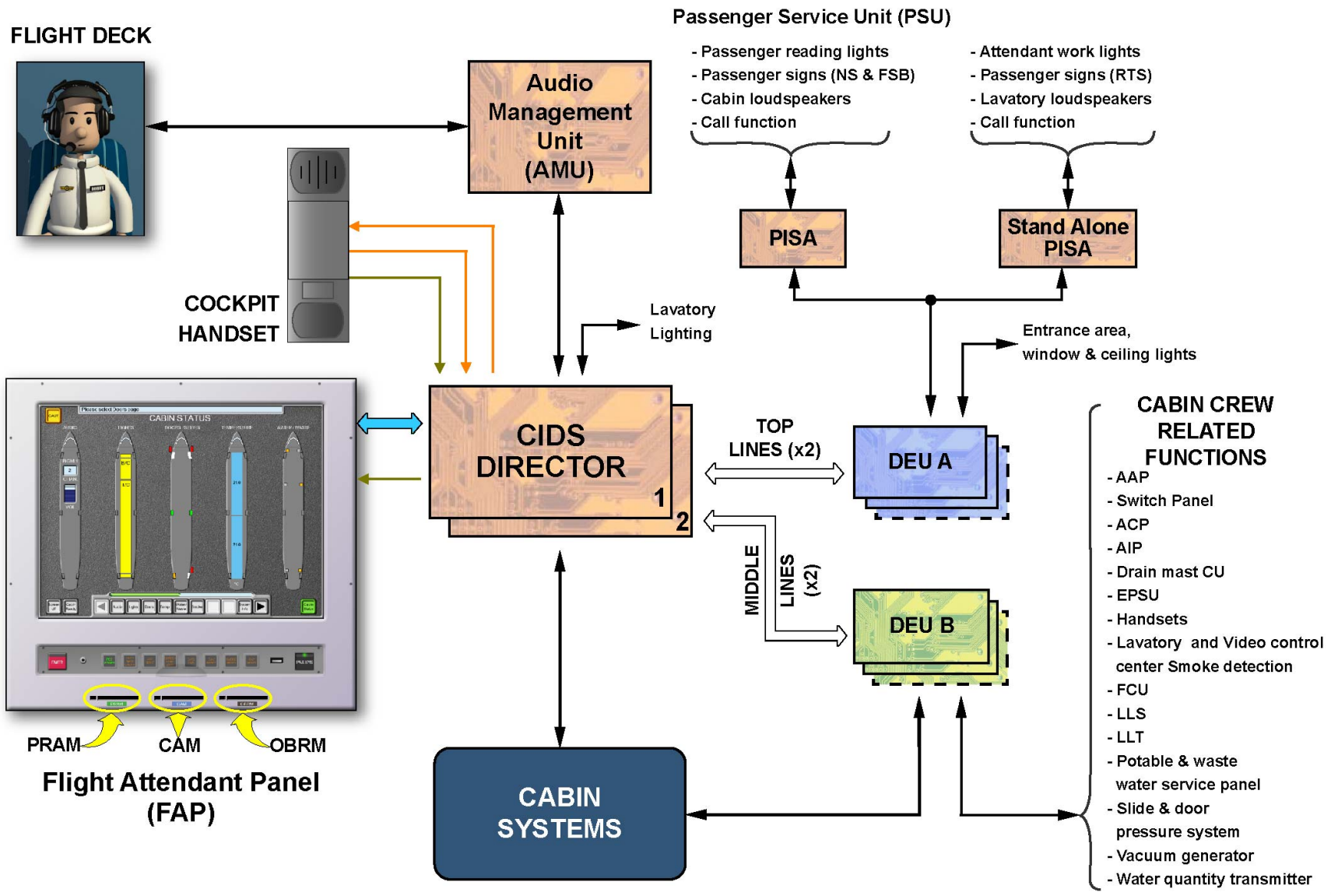
The vacuum generator sends an overheat signal to the type B DEUs via a discrete line.

LAVATORY SMOKE DETECTOR

The lavatory smoke detectors are connected to the type B DEUs via Controller Area Network (CAN) bus.

WATER QUANTITY TRANSMITTER

The water quantity transmitter transmits an analog signal to the type B DEUs.



GENERAL ... DEU B

CIDS DIRECTOR DESCRIPTION/OPERATION (3)

GENERAL

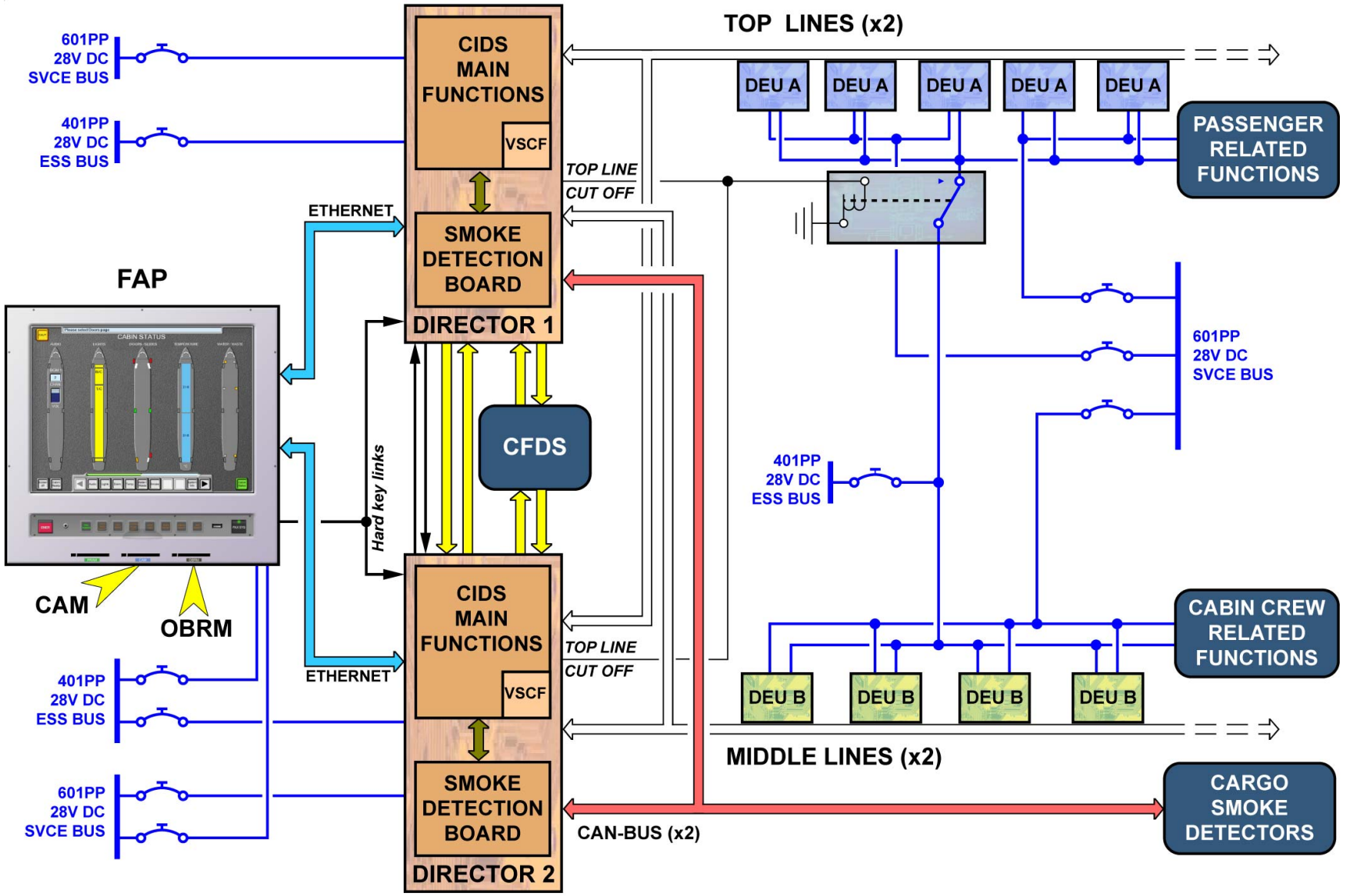
For redundancy, the system has two identical directors (DIRs). In normal operation, DIR 1 is active and DIR 2 is in hot stand-by. DIR 2 receives and computes the same data as DIR 1 but its outputs are disabled when director1 is available. The director commands cabin equipment via Decoder/Encoder Units (DEUs). The cargo smoke system is linked by Controller Area Network (CAN) buses. The Flight Attendant Panel (FAP) is linked by ethernet buses.
Each DIR is separated in two parts:
- the DIR main functions with the integrated Vacuum System Control (VSC) function,
- the smoke detection board.

Both parts work independently with segregated hardware and software. System reconfiguration for the installation of options, cabin reconfiguration or Cabin Intercommunication Data System (CIDS) expansion is limited to software database changes. These databases are the On Board Replaceable Module (OBRM) and Cabin Assignment Module (CAM). The CIDS is also designed to detect internal and external faults. The CIDS is a Type 1 system. The DIRs are connected by ARINC data buses to the Centralized Fault Display System (CFDS) for maintenance purposes. In the normal mode, the SerViCE BUS supplies the FAP (with the optional power supply with CIDS A318 type, the FAP is supplied by the HOT BAT BUS), all DIRs, and all DEUs with 28V DC. The system operates at full capacity. In the emergency mode, only the ESSential BUS supplies 28V DC to the CIDS. The type A DEUs, which are connected to the top lines, are then only supplied with power when a Passenger Address (PA) signal is present. If there is no PA signal, the DIR operates the top line cut-off relays to stop the power supply to the DEUs.

FUNCTIONS

The DIR is a central control and interface component of the CIDS. The current cabin layout and properties of layout related equipment are stored in the DIRs. The DIR provides the following functions:
- the transmission of digitized audio signals,
- the transmission of control data and commands,
- the adaptation of received DEU data,
- the control of other CIDS functional units,
- the control of the FAP,
- the data transfer to the Passenger Entertainment System (PES),
- the service interphone system,
- the control of the Additional Attendant Panel (AAP) via type B DEUs,
- the interface to cockpit and avionics compartment,
- the handling of cabin systems related inputs and outputs,
- the control and interface of other systems,
- the realization of programming functions,
- the realization of test functions,
- the activation of emergency mode with minimum power consumption.

UGB13131 - U7ST0M0 - UM23DB000000002



GENERAL & FUNCTIONS

CIDS DIRECTOR DESCRIPTION/OPERATION (3)

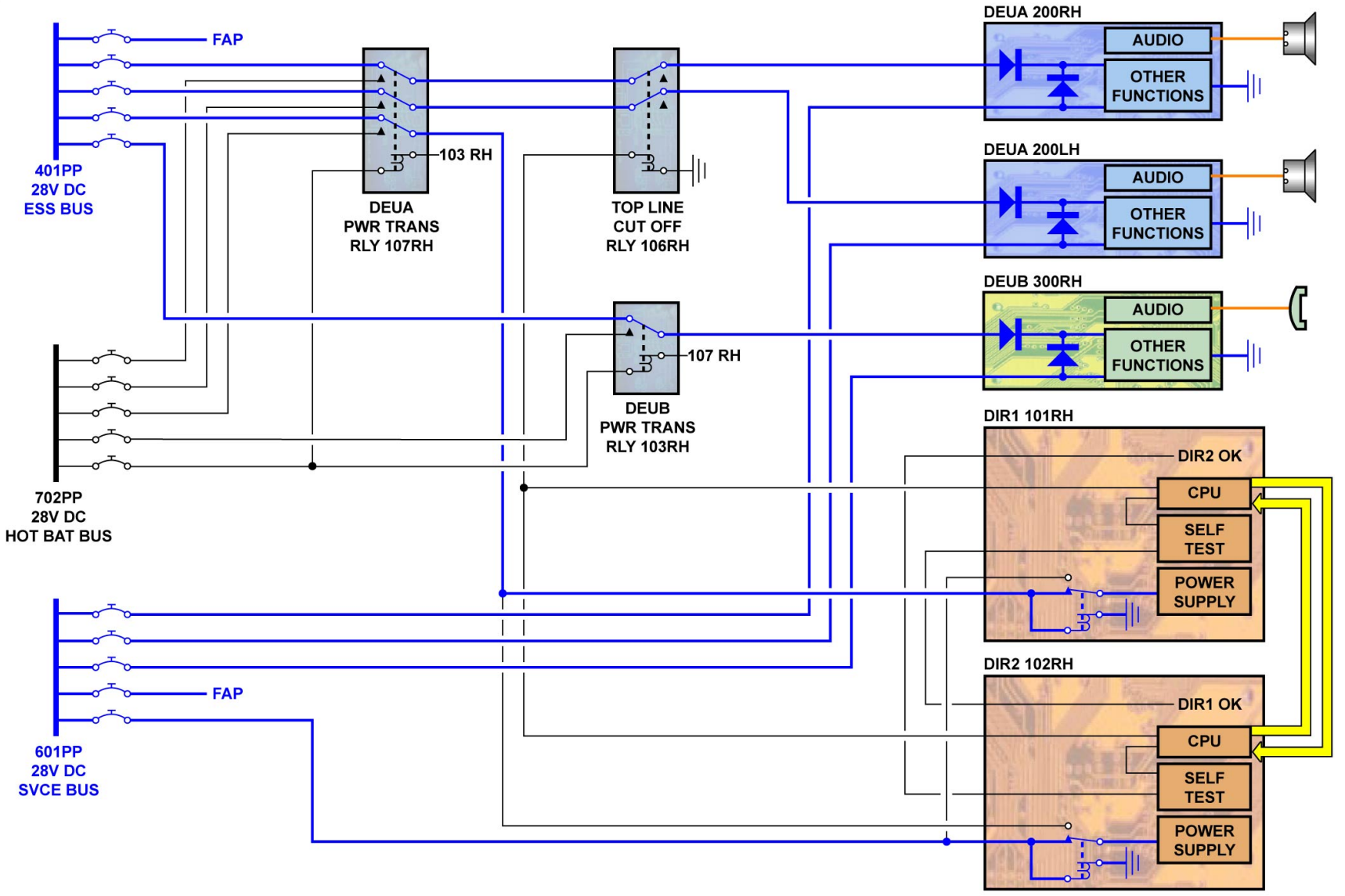
NORMAL POWER SUPPLY

The DIRs are continuously energized when the ESS and SVCE BUS are energized. In normal operation, the ESS BUS supplies:
- the active DIR,
- all the circuit in DEU A which is necessary for PA operation,
- all the circuit in DEU B which is necessary for PA and interphone.

In normal operation, the SVCE BUS supplies:
- the hot stand by DIR,
- the remaining non essential circuit of the DEUs,
- the FAP.

NOTE: The SVCE BUS also supplies, the Area Call Panels (ACPs), the Attendant Indication Panels (AIPs) and the AAP, via DEU B.

UGB13131 - U7ST0M0 - UM23DB000000002



NORMAL POWER SUPPLY

CIDS DIRECTOR DESCRIPTION/OPERATION (3)

ABNORMAL POWER SUPPLY

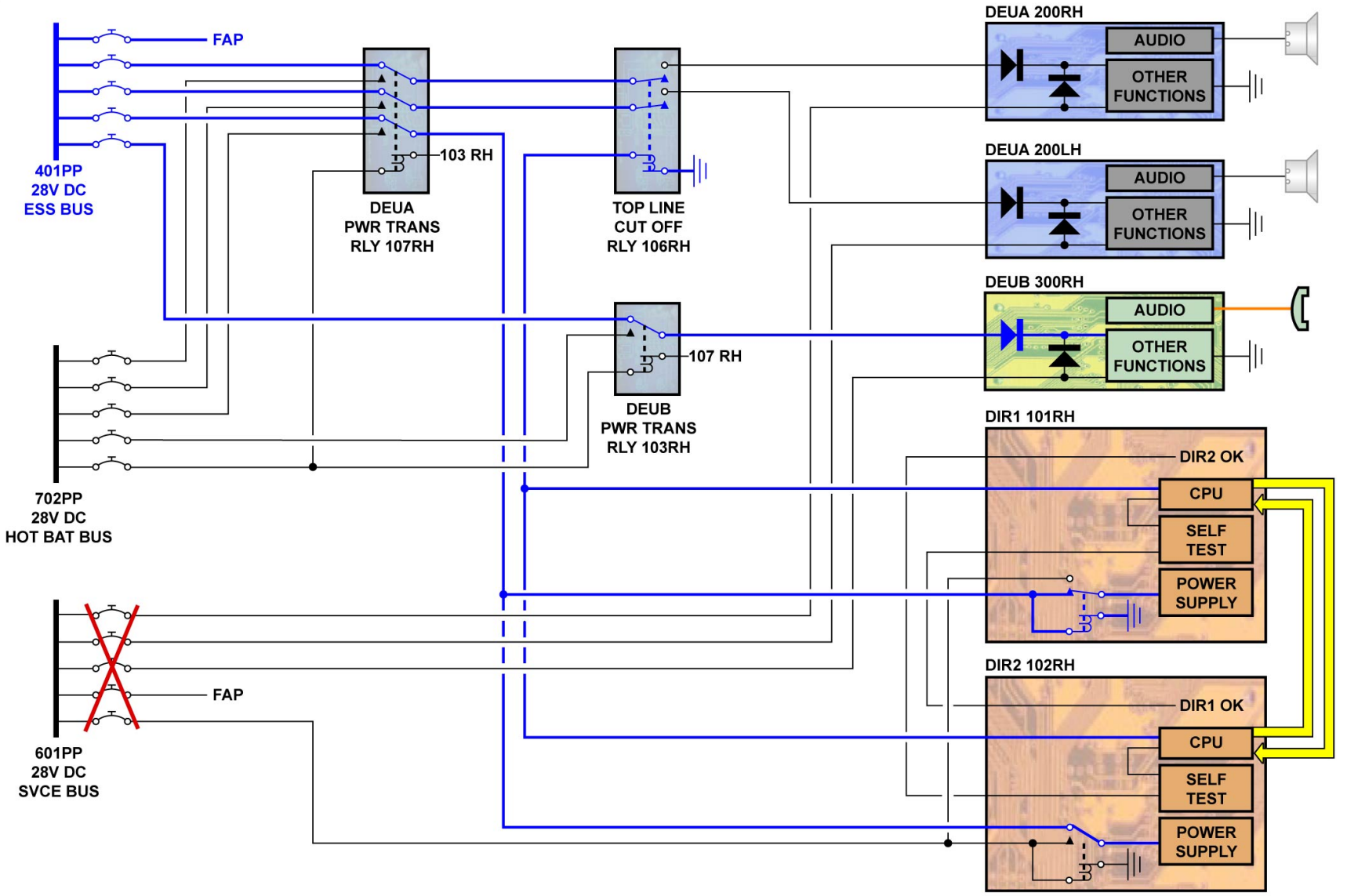
SERVICE BUS UNAVAILABLE

If SVCE BUS power is unavailable, the essential bus supplies power to the CIDS. The system only operates with minimum functions:
- Passenger Address,
- Cabin interphone,
- EVAC,
- Smoke indication.

In this configuration, the type A DEUs only receive power when there is an audio signal. If there is no audio signal, the director operates the Top Line cut-off relay to stop the power supply to the DEUs.

NOTE: The AIPs and the ACPs are also unserviceable because they receive SVCE BUS power from the type B DEUs.

UGB13131 - U7ST0M0 - UM23DB000000002



ABNORMAL POWER SUPPLY - SERVICE BUS UNAVAILABLE

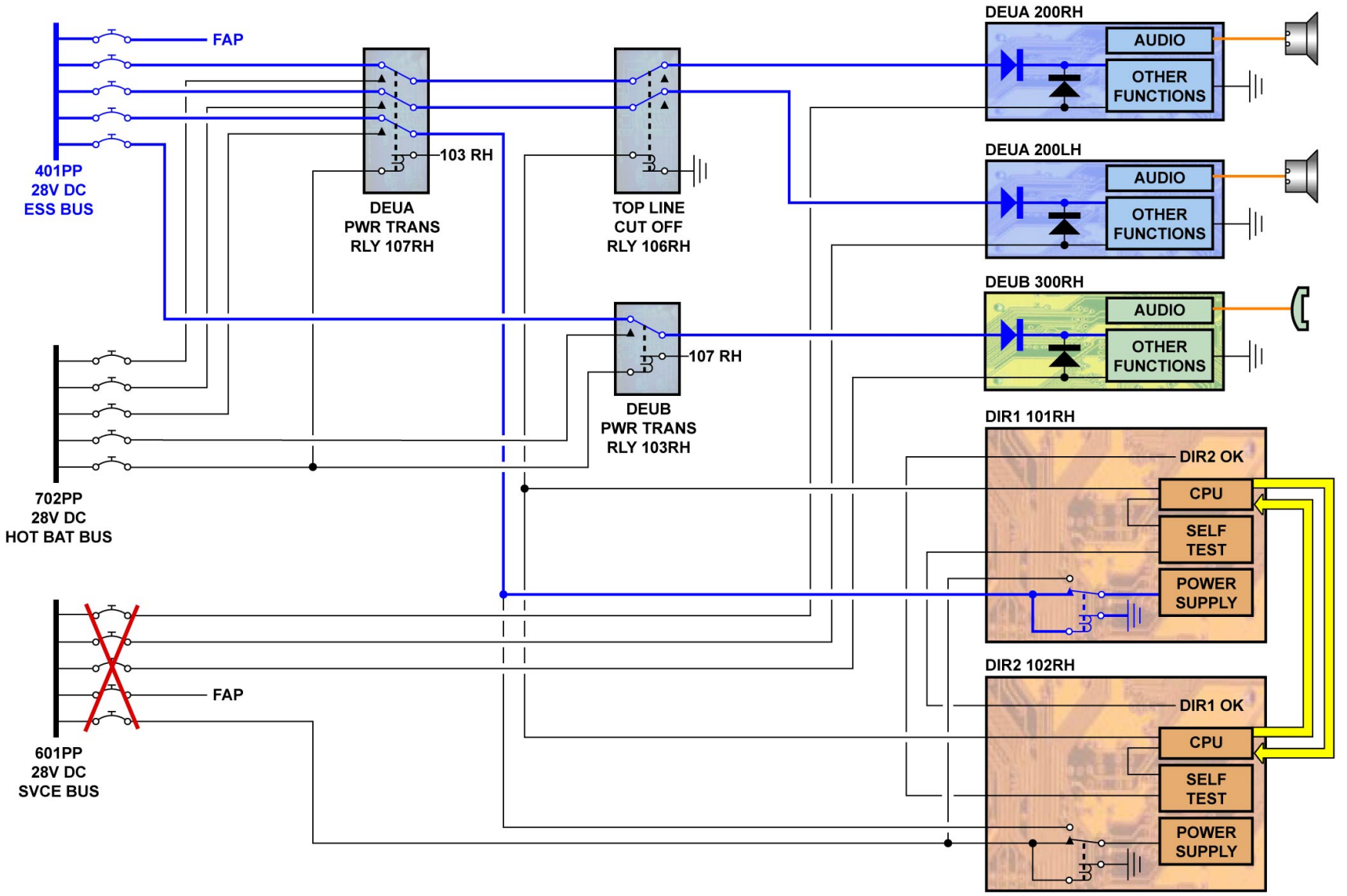
CIDS DIRECTOR DESCRIPTION/OPERATION (3)

ABNORMAL POWER SUPPLY (continued)

PASSENGER ADDRESS OPERATION

If a PA operation is done, the top line cut-off relay is no longer energized, and then the ESS BUS supplies the circuit in type A DEUs which is necessary for PA operation.

UGB13131 - U7ST0M0 - UM23DB000000002



ABNORMAL POWER SUPPLY - PASSENGER ADDRESS OPERATION

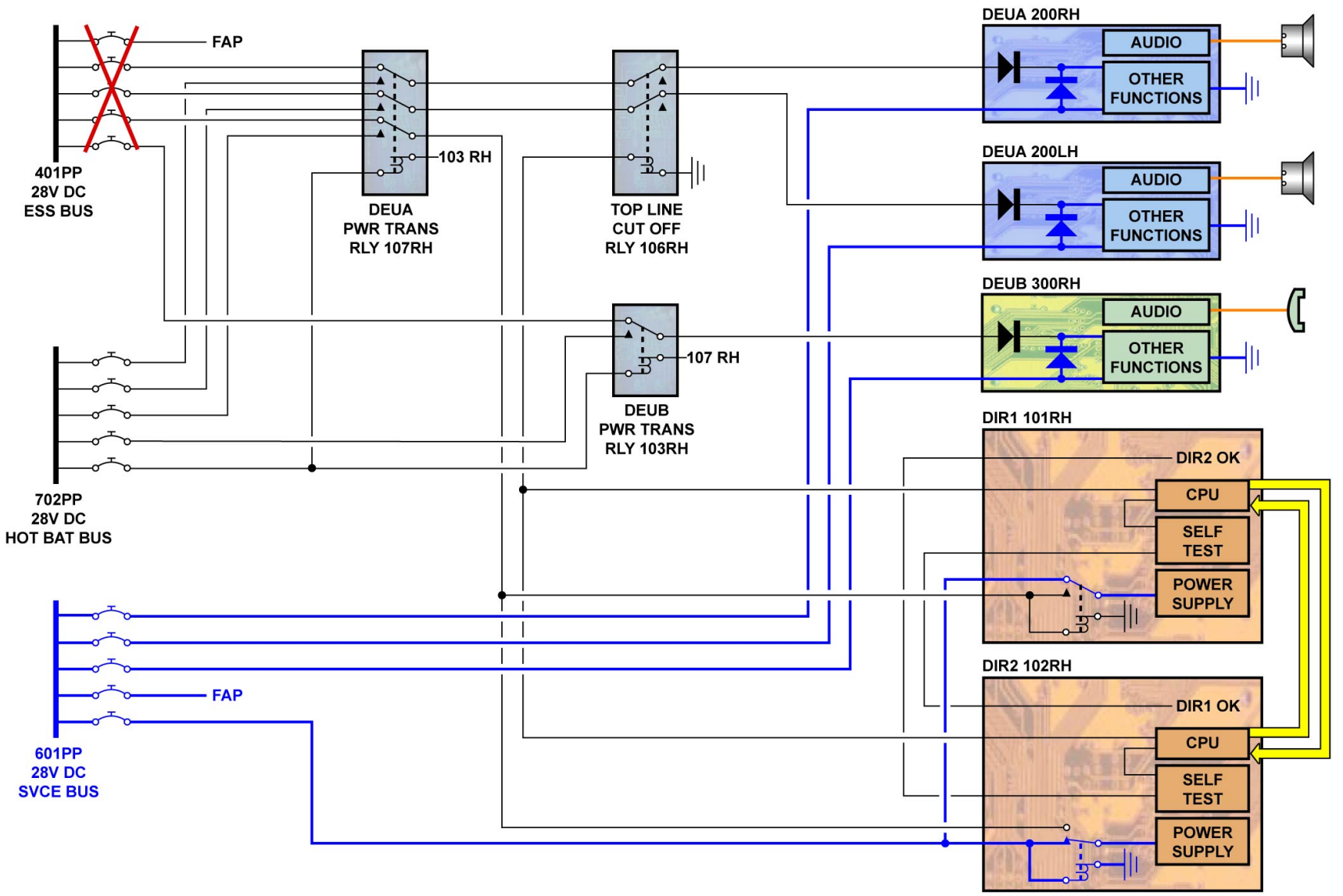
CIDS DIRECTOR DESCRIPTION/OPERATION (3)

ABNORMAL POWER SUPPLY (continued)

ESSENTIAL BUS UNAVAILABLE

If the ESS BUS power is lost, circuit in the directors and DEUs switches the essential circuits to the SVCE BUS. This keeps full CIDS capabilities except for emergency mode operation.

UGB13131 - U7ST0M0 - UM23DB000000002



ABNORMAL POWER SUPPLY - ESSENTIAL BUS UNAVAILABLE

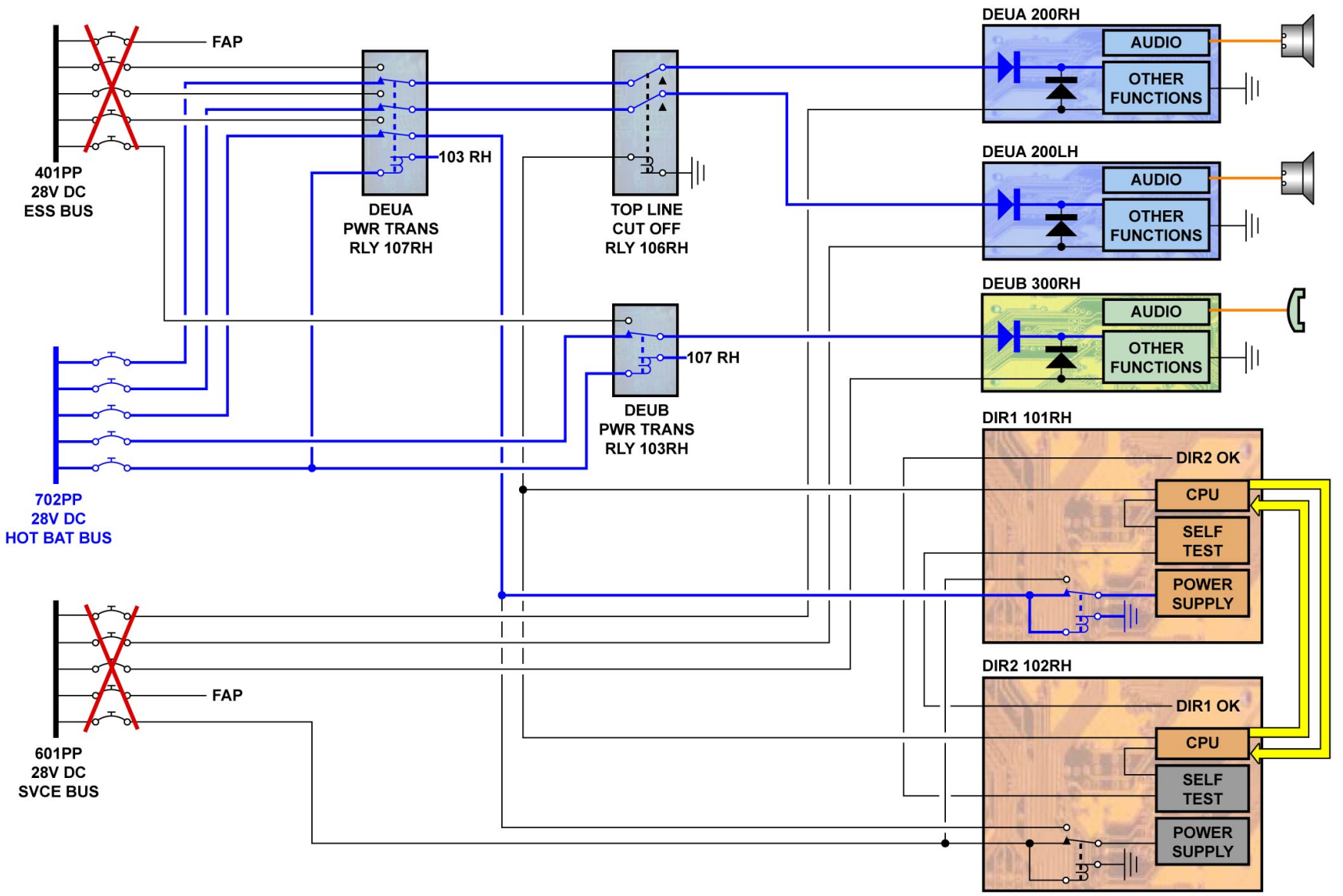
CIDS DIRECTOR DESCRIPTION/OPERATION (3)

ABNORMAL POWER SUPPLY (continued)

MAIN BUSES UNAVAILABLE

If the aircraft loses main power: the SVCE BUS and the ESS BUS, and the emergency exit lights switch is set to arm or on, all CIDS units, which are supplied by ESS BUS, are switched automatically to the HOT BATtery BUS.

UGB13131 - U7ST0M0 - UM23DB000000002



ABNORMAL POWER SUPPLY - MAIN BUSES UNAVAILABLE

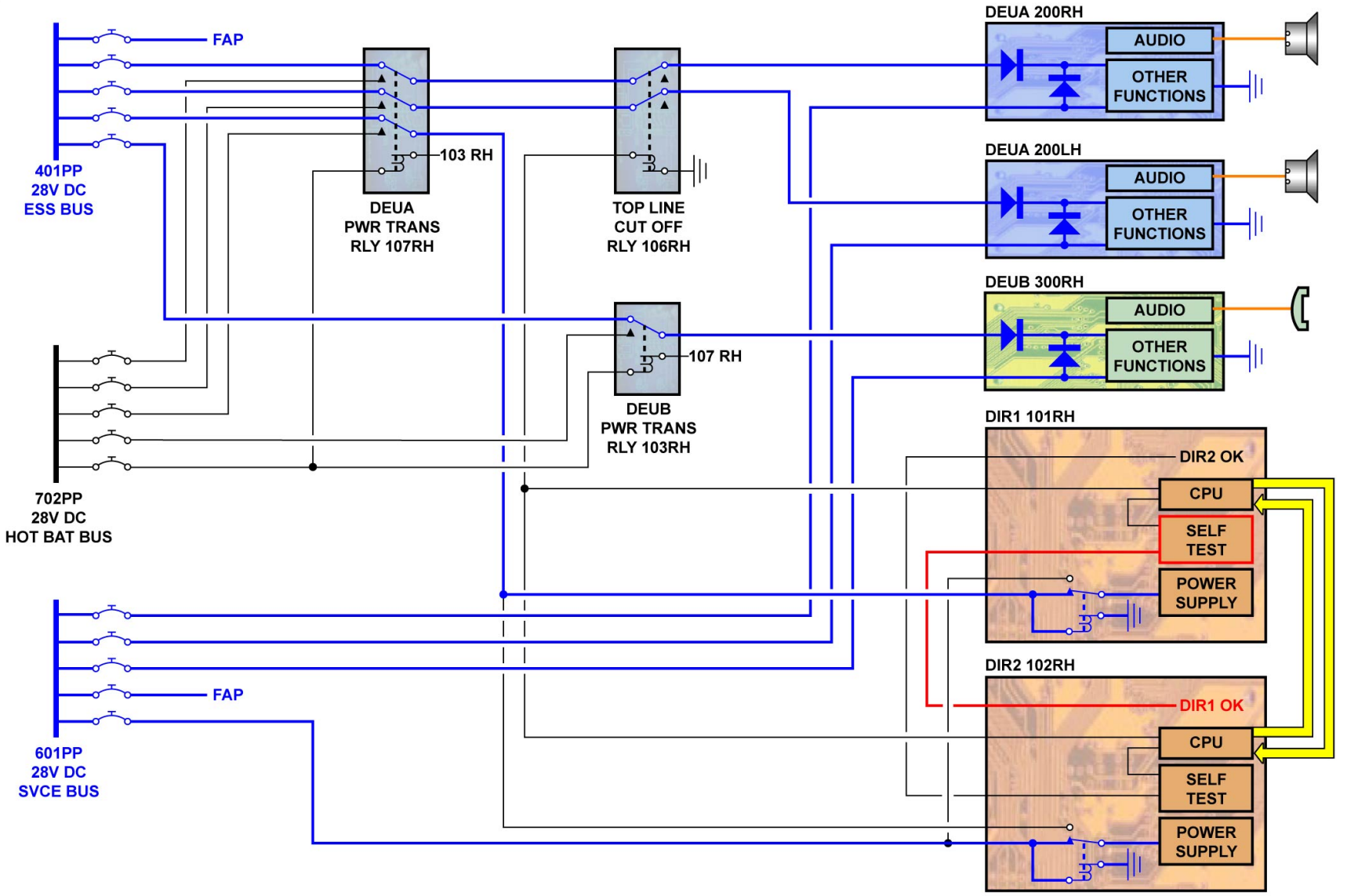
CIDS DIRECTOR DESCRIPTION/OPERATION (3)

BITE

SELF-TEST

On CIDS energization or reset, all DIR interfaces are disabled and the DIRs are initialized (self-test). The self-test is repeated periodically. It also includes a test of the data bus lines. The power connections are arranged such that DIR 1 is normally fully active and in control of the CIDS. DIR 2 is in a hot-standby mode. A failure in the initialization process in DIR 1 causes a deactivation of the DIR 1 hardware and a switchover of control to DIR 2. If the self-test of DIR 1 fails, DIR 2 takes over. At the same time, the power transfer relay is de-energized. This prepares DIR 2 to be supplied from the ESS BUS in abnormal or emergency mode.

UGB13131 - U7ST0M0 - UM23DB000000002



BITE - SELF-TEST

CIDS DIRECTOR DESCRIPTION/OPERATION (3)

BITE (continued)

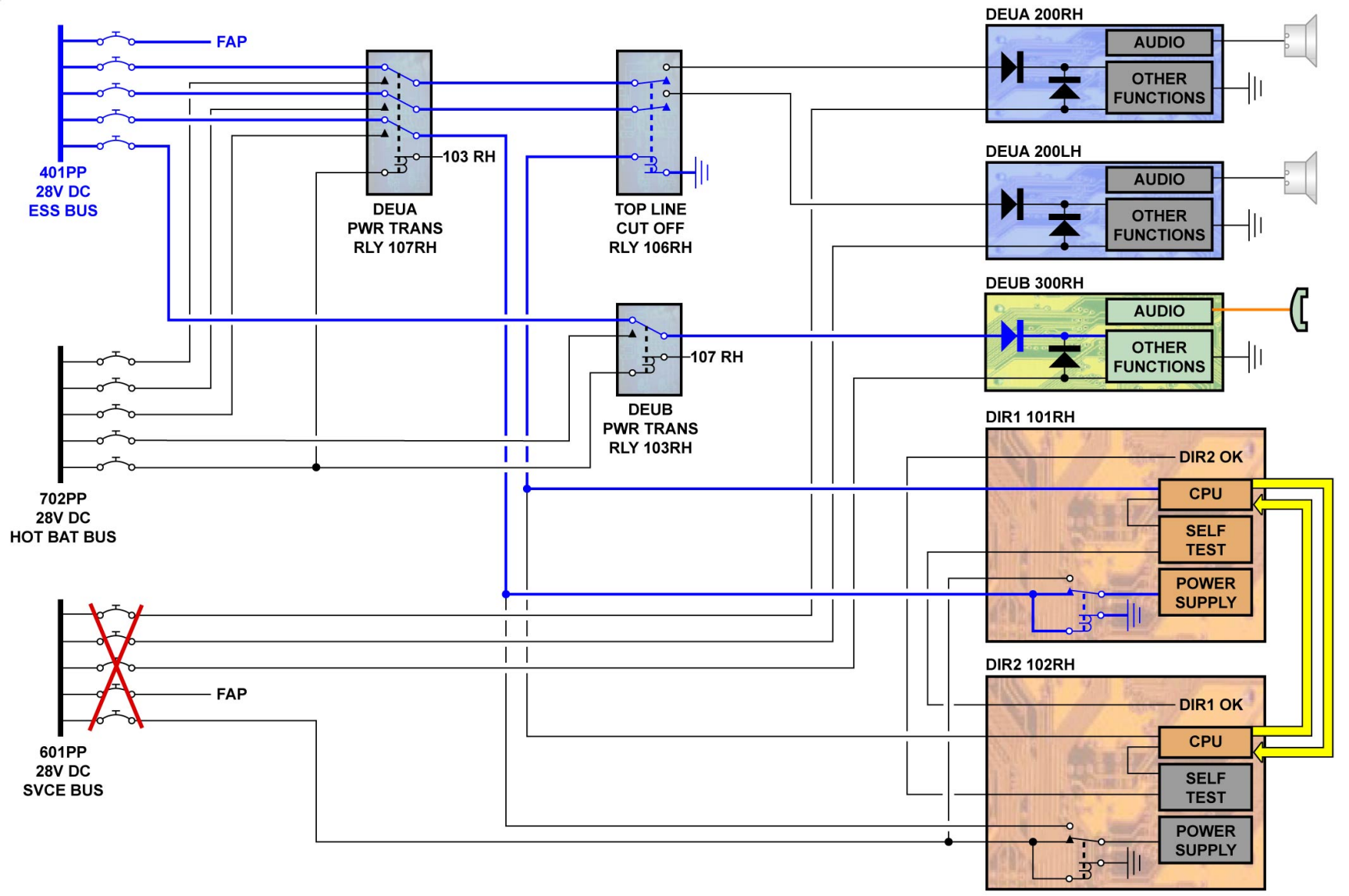
SERVICE BUS FAILURE

The DIRs internal normal power sensing circuits are always checking if power is available on the SVCE BUS. If the power fails, the following action occurs:
- as long as DIR 1 is OK, the power transfer relay remains energized,
- via the closed contact, DIR 1 sends a signal to energize the top line cut-off relay.

With the top line cut-off relay energized the emergency mode is activated. In emergency mode, the power from the ESS BUS is disconnected from all type A DEUs as long as no PA announcements are made.

NOTE: Type B DEUs are directly supplied from the ESS BUS but only for PA and interphone operations.

UGB13131 - U7ST0M0 - UM23DB000000002



BITE - SERVICE BUS FAILURE

CIDS DIRECTOR DESCRIPTION/OPERATION (3)

BITE (continued)

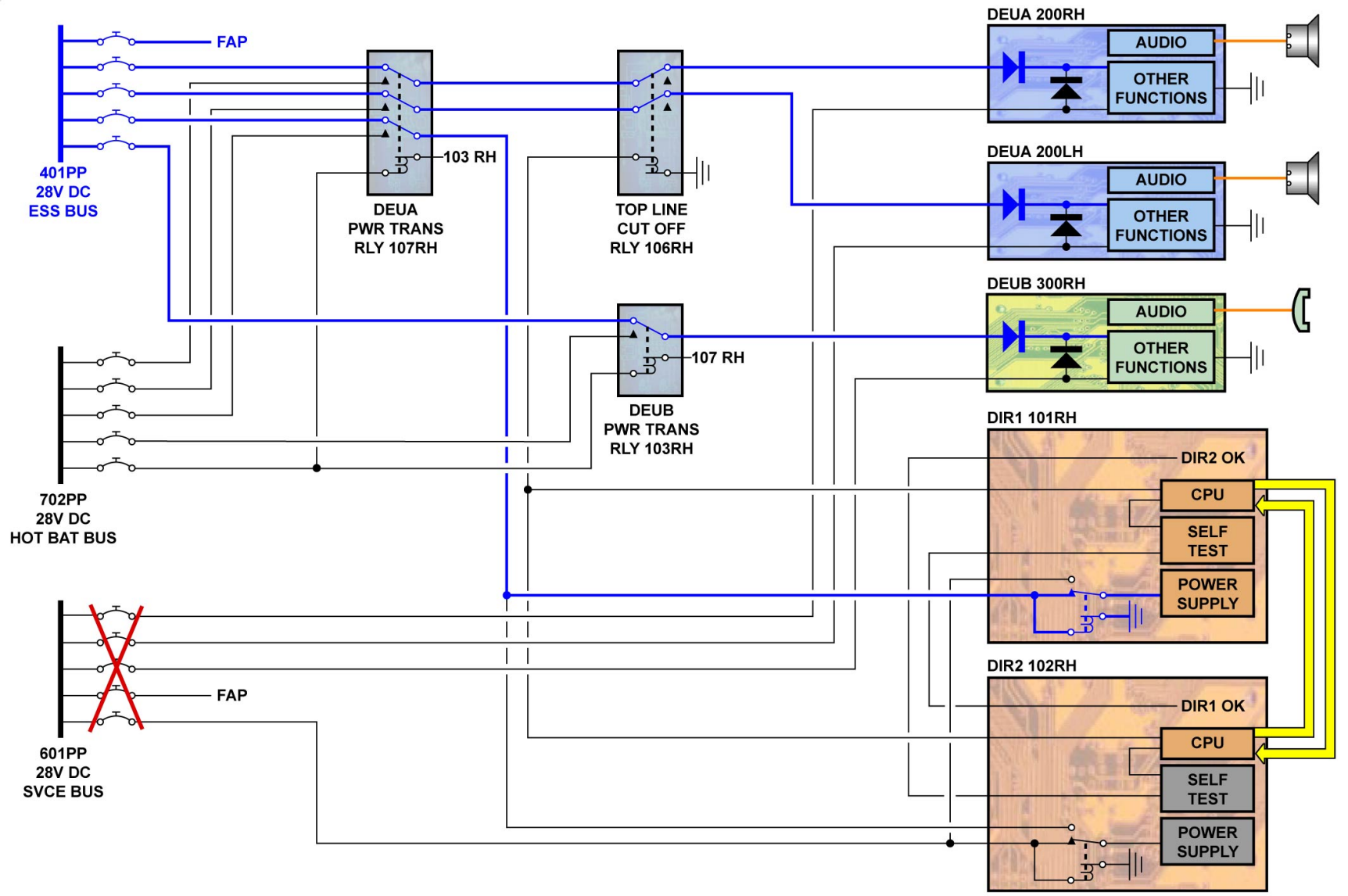
PASSENGER ADDRESS ACTIVATION

Activation of the PA system causes the top-line cut-off relay de-energization by the DIR 1. Power from the ESS BUS supplies the ESS circuits of type A and B DEUs, and DIRs.. All BITE results are stored in the DIR BITE dedicated memory. The following items may give failure indications:
- the CIDS CAUTion light,
- the ECAM warning page,
- the ECAM status page,
- the respective MCDU pages.

The following items of equipment have their own BITE functions and send their BITE status to the DIRs:
- each DEU,
- the FAP,
- the connected equipment such as PES.

The DEUs are able to test the connected equipment.

UGB13131 - U7ST0M0 - UM23DB000000002



BITE - PASSENGER ADDRESS ACTIVATION

CIDS TYPE A DEU DESCRIPTION/OPERATION (3)

GENERAL

Top line data buses link the directors (DIRs) to type A Decoder/Encoder Units (DEUs) for passenger related functions. One twisted pair of cable on each cabin side connects all type A DEUs installed on the same side.

FUNCTIONS

The Cabin Intercommunication Data System (CIDS) uses each type A DEU to control cabin lighting, signs and cabin loudspeakers according to cabin parameters programmed in the Cabin Assignment Module (CAM). The passenger functions are centralized in the Passenger Service Unit (PSU). The Passenger Interface and Supply Adapter (PISA) is the PSU interface with the DEU A. A PISA is integrated into each PSU. Each DEU can control up to 6 PISAs or stand alone PISAs. One PISA interfaces with:
- reading light switches and Light Emitting Diode (LED) reading lights,
- passenger call buttons and call lights/seat row numbering lights,
- loudspeakers,
- No Smoking (NS) and Fasten Seat Belt (FSB) signs.

One stand alone PISA interfaces with:
- loudspeaker,
- NS, FSB signs
- Attendant work lights.

Each type A DEU interfaces with:
- PISAs and STA PISAs,
- loudspeakers,
- fluorescents strips and ballasts units,
- NS and FSB signs.

TOP LINE DATA BUS

One top line data bus on each side of the passenger cabin connect the type A DEUs to the directors. Top lines are bi-directional serial high-speed data buses.

NOTE: Note: The last connection box on the top line includes a bus termination resistor for impedance matching.

CONNECTION BOX

Each connection box is connected to a DEU. It gives the DEU its own address by the two coding switches. This method enables replacement of DEUs without selecting their address.

CIDS POWER-UP

When the CIDS is powered-up or reset, the DIR follows a power-up routine. This includes the initialization and testing of each DEU and connected equipment. The test results are transmitted to the DIR which compares them with its programmed data to decide on their status. At least 95 % of possible DEU failures are automatically detected.

FAIL SAFE OPERATION

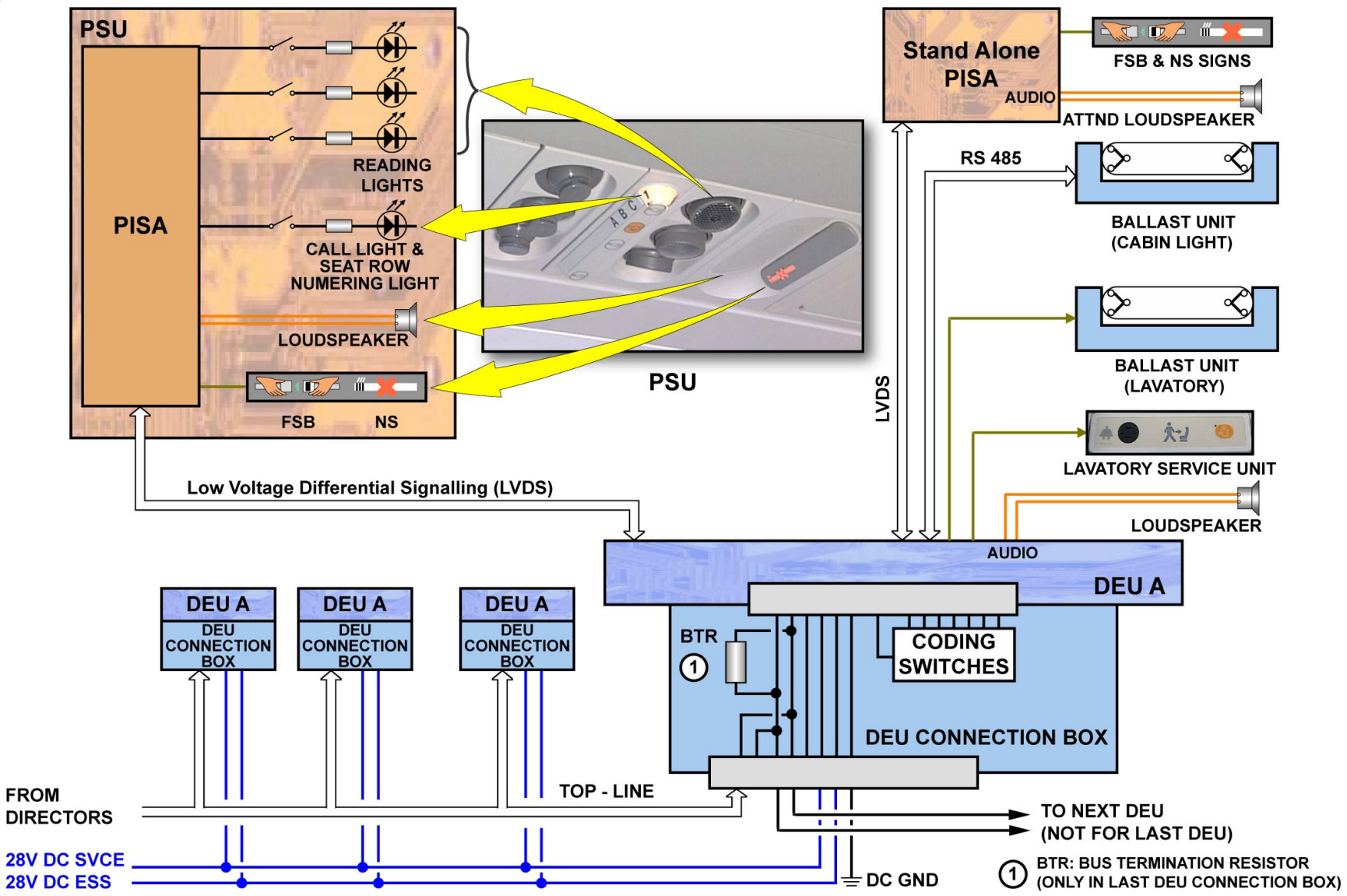
A broken wire in one top-line bus will only affect the type A DEUs behind the crack on this bus. The sound level of the operable top line is increased to make sure that the Passenger Address (PA) distribution is fulfilled for the other (not operable) top line side. An open circuit disables all DEUs after the break in the line.

EMERGENCY FUNCTIONS

All DEUs operate in emergency mode when the DC SerViCE bus is no longer powered. The DEUs are then supplied from the DC ESSential

bus. The type A DEU PA circuits and type B DEU interphone circuits remain operational.

UGB13131 - U7ST0M0 - UM23DC000000002



GENERAL ... EMERGENCY FUNCTIONS

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CIDS TYPE B DEU DESCRIPTION/OPERATION (3)

GENERAL

Middle line data buses link the directors (DIRs) to type B Decoder/Encoder Units (DEUs) for cabin crew related functions. One twisted pair of cable on each cabin side, above the ceiling, connects all type B DEUs installed on the same side.

FUNCTIONS

Up to 8 type B DEUs can be installed in the cabin. The Cabin Intercommunication Data System (CIDS) uses each type B DEU to control the different devices needed by the cabin crew and the aircraft systems. The Attendant Indication Panels (AIPs), located in the cabin crew stations, indicate (in written form) Passenger Address (PA), INTerPHone (INTPH) and other system information to the cabin crew. The Additional Attendant Panel (AAP), located in the aft cabin, to remote control of light, evac and reset. The switch panel located adjacent to the middle RH and exit RH attendant station, gives indication of the EVAC alert, on reset of acoustic and visual EVAC alert indications related to the respective attendant station, or reset of all acoustic and visual lavatory smoke warnings. The Area Call Panels (ACPs) located on the ceiling near the cabin crew stations, draw the cabin crew attention by colored lights. Each cabin crew station has a handset for passenger address and interphone functions. The following equipments are connected to type B DEUs:

- drain mast control unit,
- Emergency Power Supply Units (EPSUs),
- slide and door sensors,
- call lights,
- lavatory smoke detectors,
- waste service panel,
- potable water service panel,
- flush control unit,
- Liquid Level Sensor (LLS),
- Liquid Level Transmitter (LLT),
- potable water quantity transmitter,
- vacuum generator overheat signal.

MIDDLE LINE DATA BUS

One middle line data bus on each side of the passenger cabin connects the type B DEUs to the DIRs. Note that the last connection box on the middle line includes a bus termination resistor for impedance matching. Middle lines are bi-directional serial high-speed data buses.

CONNECTION BOX

Each connection box is connected to a DEU. It gives the DEU its own address by the two coding switches. This method enables replacement of DEUs without selecting their address.

CIDS POWER-UP

When the CIDS is powered-up or reset, the DIR follows a power-up routine. This includes the initialization and testing of each DEU and connected equipment. The test results are transmitted to the DIR which compares them with its programmed data to decide on their status. At least 95 % of possible DEU failures are automatically detected.

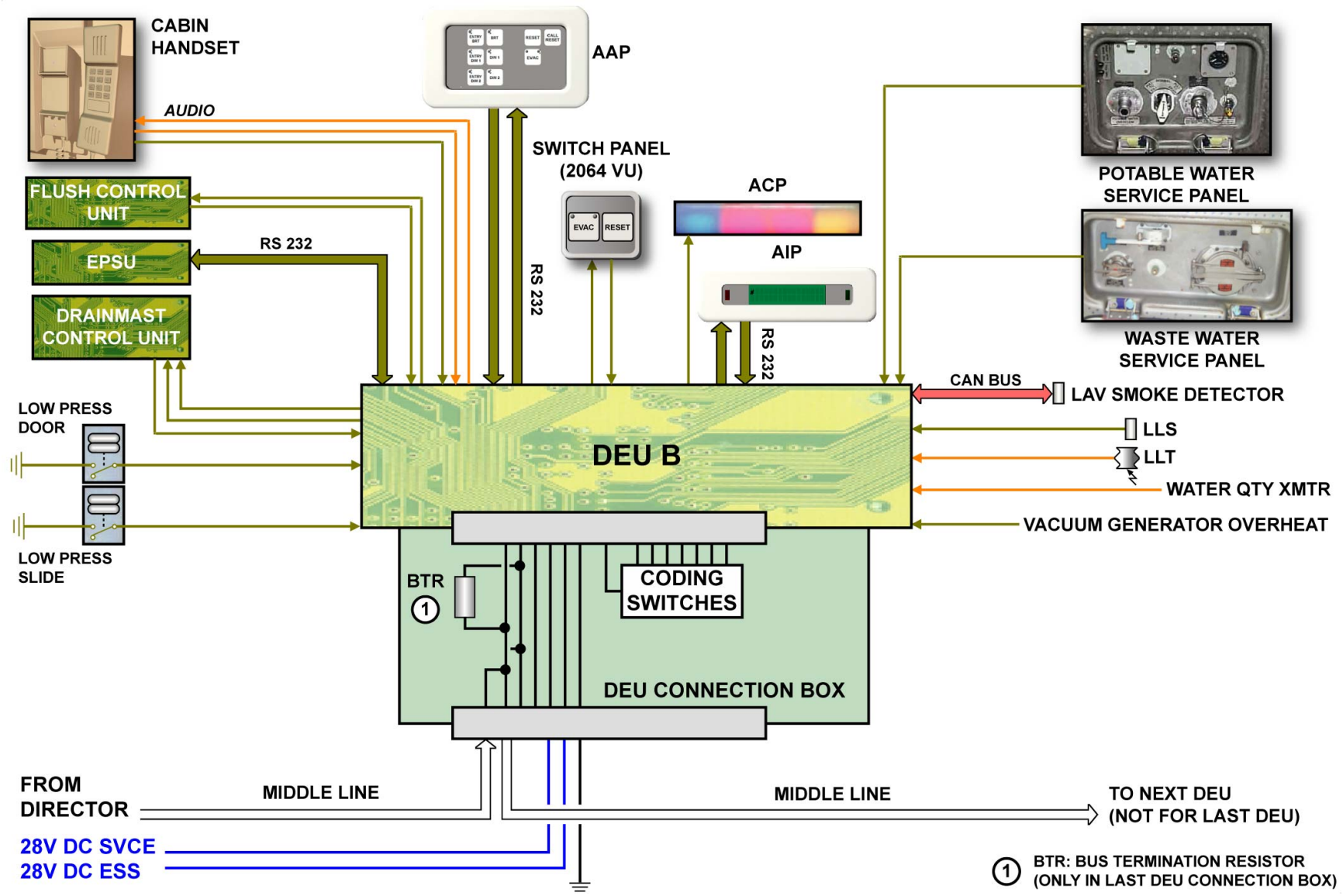
FAIL SAFE OPERATION

A failure of one middle line disables all cabin crew functions in the middle line side.

EMERGENCY FUNCTIONS

All DEUs operate in emergency mode when the DC SerViCE bus is no longer powered. The DEUs are then supplied from the DC ESSential bus. The type A DEU PA circuits and type B DEU INTPH circuits remain operational.

UGB13131 - U7ST0M0 - UM23DD000000002



GENERAL ... EMERGENCY FUNCTIONS

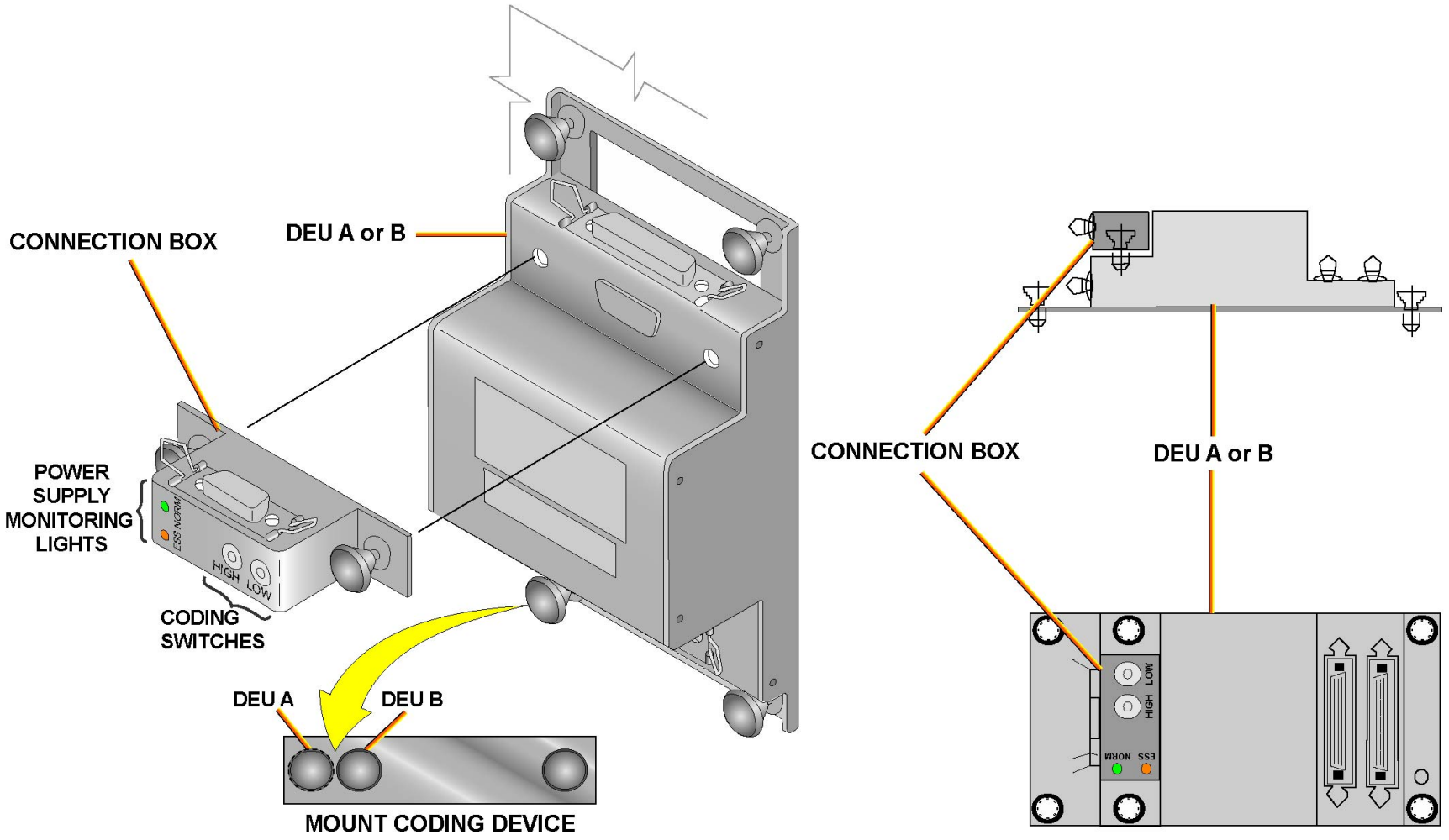
CIDS DEU MOUNT DESCRIPTION (3)

DEU MOUNT DESCRIPTION

The type A and type B Decoder/Encoder Units (DEUs) are physically the same, however a type A DEU cannot be replaced by a type B DEU and vice versa due to a mount coding device. Connection boxes connected to the middle line are physically the same as the ones connected to the top lines. On each DEU connection box, there are two address-coding switches which give the DEU its own address. In case of a connection box change make sure that the coding switches are correctly set for the location. There are power supply monitoring lights on each connection box. The green NORMal LED is on if the DC SerViCE BUS power is good. The amber ESSential LED is on if the DC ESS BUS power is good.

NOTE: A bus termination resistor is installed on the last DEU connection box of each line, for impedance matching.

UGB13131 - U7ST0M0 - UM23DE000000002



DEU MOUNT DESCRIPTION

ATTENDANT INDICATION PANEL (AIP) D/O (3)

GENERAL

The Attendant Indication Panel (AIP) is a display panel which indicates the system information processed by the Cabin Intercommunication Data System (CIDS). The AIP is installed near all attendant stations which have a handset for Passenger Address (PA) and interphone purposes.

FUNCTIONS

The AIP fulfills the following functions:
- display of handset-related information,
- interphone system messages,
- PA system messages,
- passenger (PAX)-lighted signs activation information,
- PAX call indication,
- miscellaneous information.

BITE

The circuitry of the AIP includes BITE circuitry. No internal BITE memory is available, but a BITE output indicates the operational status of the AIP. The presence of this output of a 1 Hz waveform indicates "AIP OK" to the connected Decoder/Encoder Unit (DEU) B. The BITE capabilities include power-up tests and automatic periodic tests.

MESSAGES

The AIP has a display area with an alphanumerical display in two rows, each with 16 characters. Additionally, red and green indicator lights are available and used as attention getters.

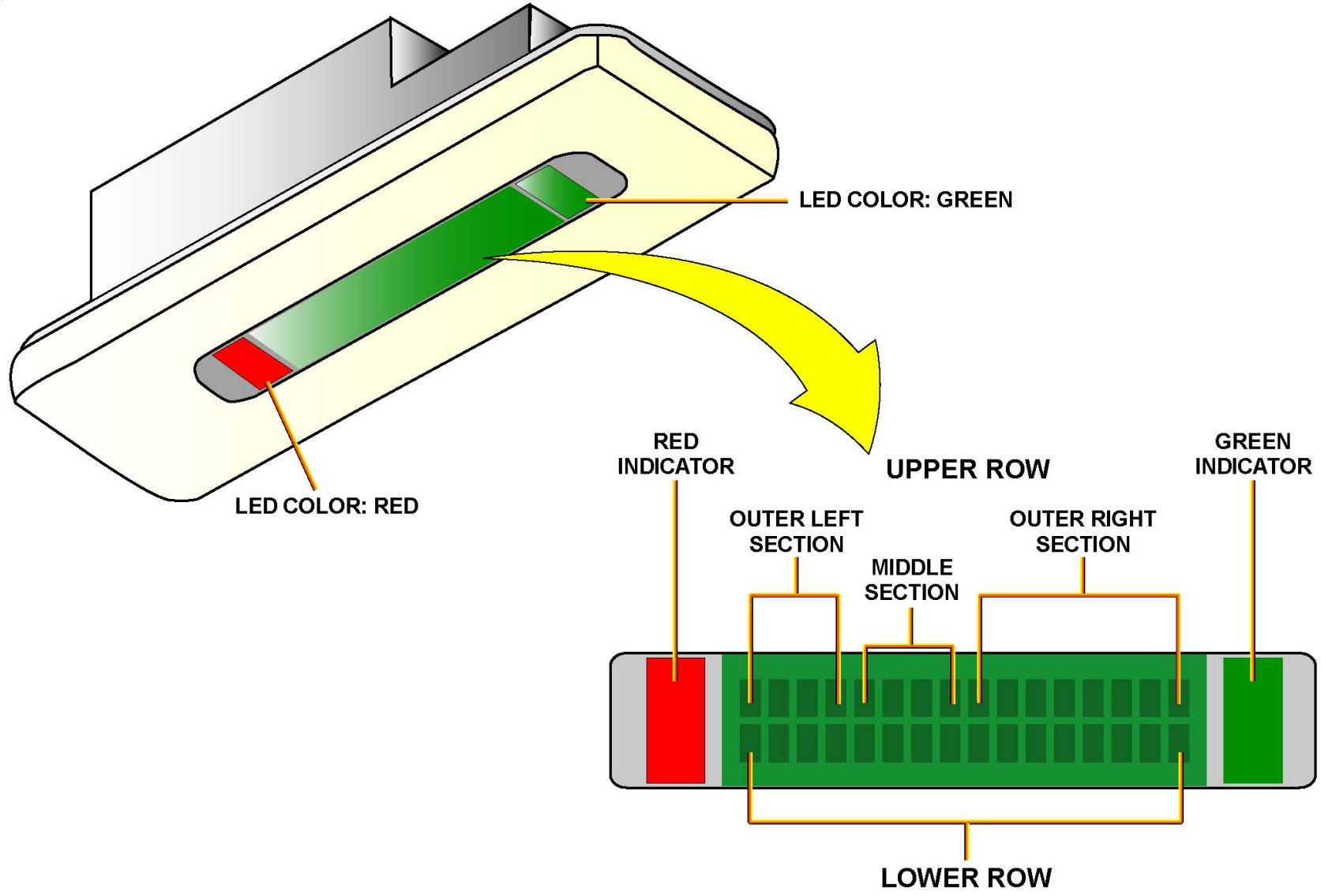
Upper Row

The upper row of the display area is used for the indication of information concerning the cabin and flight crew interphone system. The upper row is divided into 3 sections, 2 sections with 4 characters and one with 8 characters width. The outer left section is used to show the handset status information. The middle section is left blank and will not be used. The outer right section will show information about the desired interphone station or system function. For special high priority calls, the full width of the top line of the display will be used.

Lower Row

The lower row of the display indicates the system information which is derived from the CIDS.

UGB13131 - U7ST0M0 - UM23DF000000001



GENERAL ... MESSAGES

ATTENDANT INDICATION PANEL (AIP) D/O (3)

MESSAGES (continued)

Handset Operation Related Messages (PART 1)

The texts shown for the handset operation are derived from the combination of 2 texts shown in the outer left and right sections. The text shown in the outer left display indicates the operational status of the associated handset station. The following texts (max. 4 characters) can appear: (see table 1). Texts shown in the outer right section of the display area indicate the selected function or, if the station is called, the designation of the calling station will be displayed. The following texts will appear:

- PA related messages (see table 2),
- interphone related messages (see table 3),
- indications at called station (outer right section).

UGB13131 - U7ST0M0 - UM23DF000000001

TABLE 1

TEXT	MEANING
#	Symbolic Indication: The handset has been taken off the hook. The system awaits the first dial code.
##	The system awaits a second dial code (only displayed if this is required).
CALL	The station has been called. Only used in conjunction with designation of the calling station.
CNCL	A previously established link has been cancelled, because the participating station has been called by a higher priority call. Only used in conjunction with the designation of the disconnected station.
OVER	The station has been called by a high priority call while another link has been established previously. Only used in conjunction with the designation of the calling station.
WAIT	A previously selected PA function has been overidden by a high priority station. The function is interrupted until the overidden station has been put back on the hook. Only used in conjunction with the designation of the selected PA function.
RST	The "RESET" button has been pushed. This text is displayed for approx. 1 sec. Then the "#" symbol appears.
ERR	A selected function is not available, e.g. the link to the Service Interphone System has been requested in flight.

TABLE 2

TEXT	SELECTED FUNCTION	
PA ALL	PA ALL and Direct PA	
PA 1	PA 1st zone	*
PA 2	PA 2nd zone	*
PA 3	PA 3rd zone	*

TABLE 3

TEXT	SELECTED FUNCTION	
CAPTAIN	normal call from cockpit	
FWD L	normal call from FWD L attendant	
FWD R	normal call from FWD R attendant	*
AFT L	normal call from AFT L attendant	
AFT R	normal call from AFT R attendant	

* = OPTIONAL

MESSAGES - HANDSET OPERATION RELATED MESSAGES (PART 1)

ATTENDANT INDICATION PANEL (AIP) D/O (3)

MESSAGES (continued)

Handset Operation Related Messages (PART 2)

For the indications at the calling station (outer right section), see table 4. For the Indications of high priority interphone functions at all stations (whole upper row), see table 5. The System Status Related Messages are available and will be displayed on the lower row of the display as long as the respective function is done, (see table 6).

UGB13131 - U7ST0M0 - UM23DF000000001

TABLE 4

TEXT	SELECTED FUNCTION	
CAPTAIN	call captain	
PURSER	call purser	*
FWD	call FWD attendant	
AFT	call AFT L attendant	
SERV INT	service interphone selected	

TABLE 5

TEXT	SELECTED FUNCTION
EMERGENCY CALL	emergency call
CONFERENCE CALL	call all attendants (conference call)
CAPTAIN CALL	call all attendants from cockpit

TABLE 6

TEXT	MEANING	
SMOKE LAVATORY A	Smoke has been detected at the indicated lavatory. Available lavatories are: A, B, C, D, E, F G, H, K, L, M, S, T, W.	
PA ALL IN USE	PA ALL or Direct PA is made.	
PA 1 IN USE	PA 1 announcement is made.	*
PA 2 IN USE	PA 2 announcement is made.	*
PA 3 IN USE	PA 3 announcement is made.	*
PA 1+2 IN USE	PA 1 and PA 2 announcement are made.	*
PA 1+3 IN USE	PA 1 and PA 3 announcement are made.	*
PA 2+3 IN USE	PA 2 and PA 3 announcement are made.	*
SERV INT IN USE	Service Interphone is available.	*
EVACUATION ALERT	Evacuation alert has been activated.	*
PAX 25R	A passenger Call has been activated. The seat row number and seat position (L or R) are displayed.	*

* = OPTIONAL

MESSAGES - HANDSET OPERATION RELATED MESSAGES (PART 2)

ATTENDANT INDICATION PANEL (AIP) D/O (3)

MESSAGES (continued)

AIP Indicator Operation

The AIP indicators will be used as attention getters and they will be operated in conjunction with the respective messages. The operation of the AIP indicators, with respect to the different system functions, is listed in the table 7.

UGB13131 - U7ST0M0 - UM23DF000000001

TABLE 7

ACTIVATED FUNCTION	INDICATOR LIGHT		
	RED	GREEN	
LAVATORY SMOKE DETECTION	flashing	–	
EVACUATION SIGNALLING	–	–	*
SERVICE INTERPHONE	–	–	
PASSENGER CALL	–	–	
PASSENGER ADDRESS	–	–	
CABIN INTERPHONE			
- EMERGENCY CALL from cockpit	flashing	–	
- ALL ATTND CALL from cockpit	–	steady	
- PUSER CALL from cockpit	–	steady	*
- NORMAL CALL from cockpit	–	steady	
- ALL ATTND CALL from cabin	–	steady	
- PUSER CALL from cabin	–	steady	*
- NORMAL CALL from cabin	–	steady	

* = OPTIONAL

MESSAGES - AIP INDICATOR OPERATION

UGB13131 - U7ST0M0 - UM23DF000000001

AREA CALL PANEL (ACP) INDICATIONS (3)

GENERAL

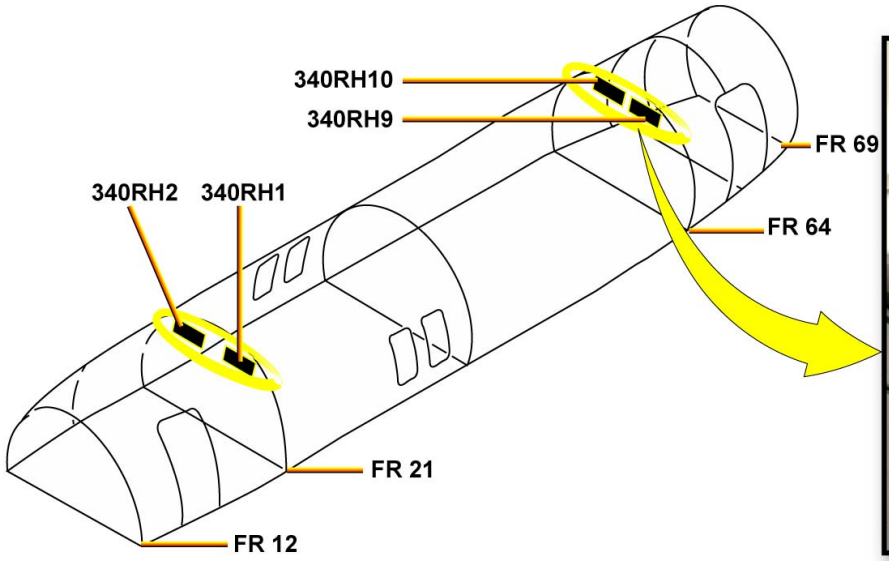
The Area Call Panel (ACP) is installed at each end of the cabin to the right and left hand sides of the centerline in the ceiling. The ACP has four separately controlled fields, each field contains colored Light Emitting Diodes (LEDs). The lights can be seen from the front or rear of the ACP. The following colors are the standard colors for the lamps:
- color 1: amber,
- color 2: pink (optionally green),
- color 3: pink (optionally green),
- color 4: blue.

The fields are activated either continuously or flashed. They are used as cabin attendants attention getters. A call via cabin or cockpit interphone will come on pink on the indicator, a blue light indicates PAX-seat call and an amber light indicates a lavatory call.

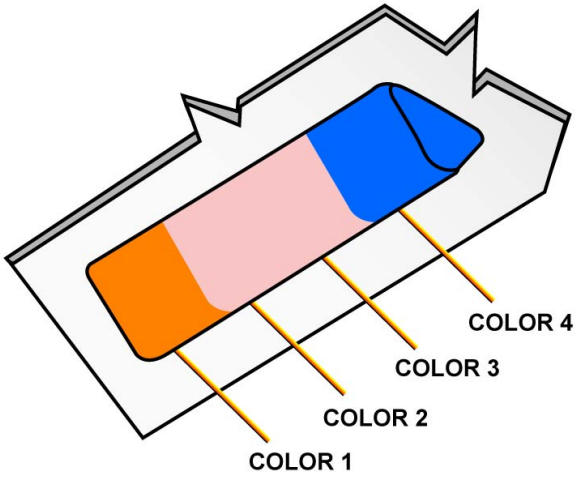
OPERATION

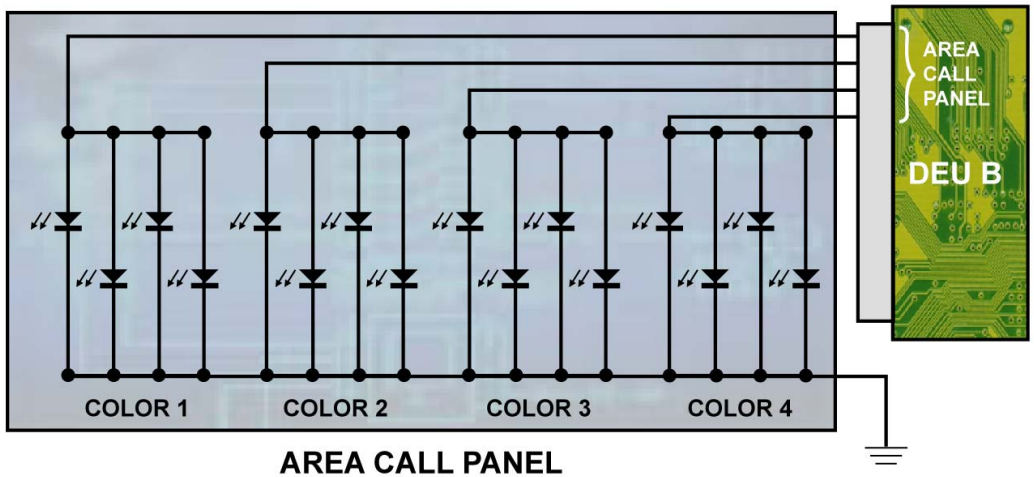
Five discrete connections link each ACP to a nearby Decoder/Encoder Unit (DEU) B. One is for each field and one for a common connection to the LEDs. The DEU B switches the LEDs. Any field or combination of fields can be flashed.

UGB13131 - U7ST0M0 - UM23F3000000001



TYPICAL AFTER ATTENDANT STATION





AREA CALL PANEL

GENERAL & OPERATION

CABIN ATTENDANT HANDSET PRESENTATION (2)

GENERAL

Each attendant station has a handset for public announcement, interphone dialing and communication. The handset rests in a cradle.

FUNCTION

The handset and cradle fulfill the following functions:
- the hook-off sensing,
- the Push-To-Talk (PTT) switching,
- the Passenger Address (PA) announcement,
- the interphone.

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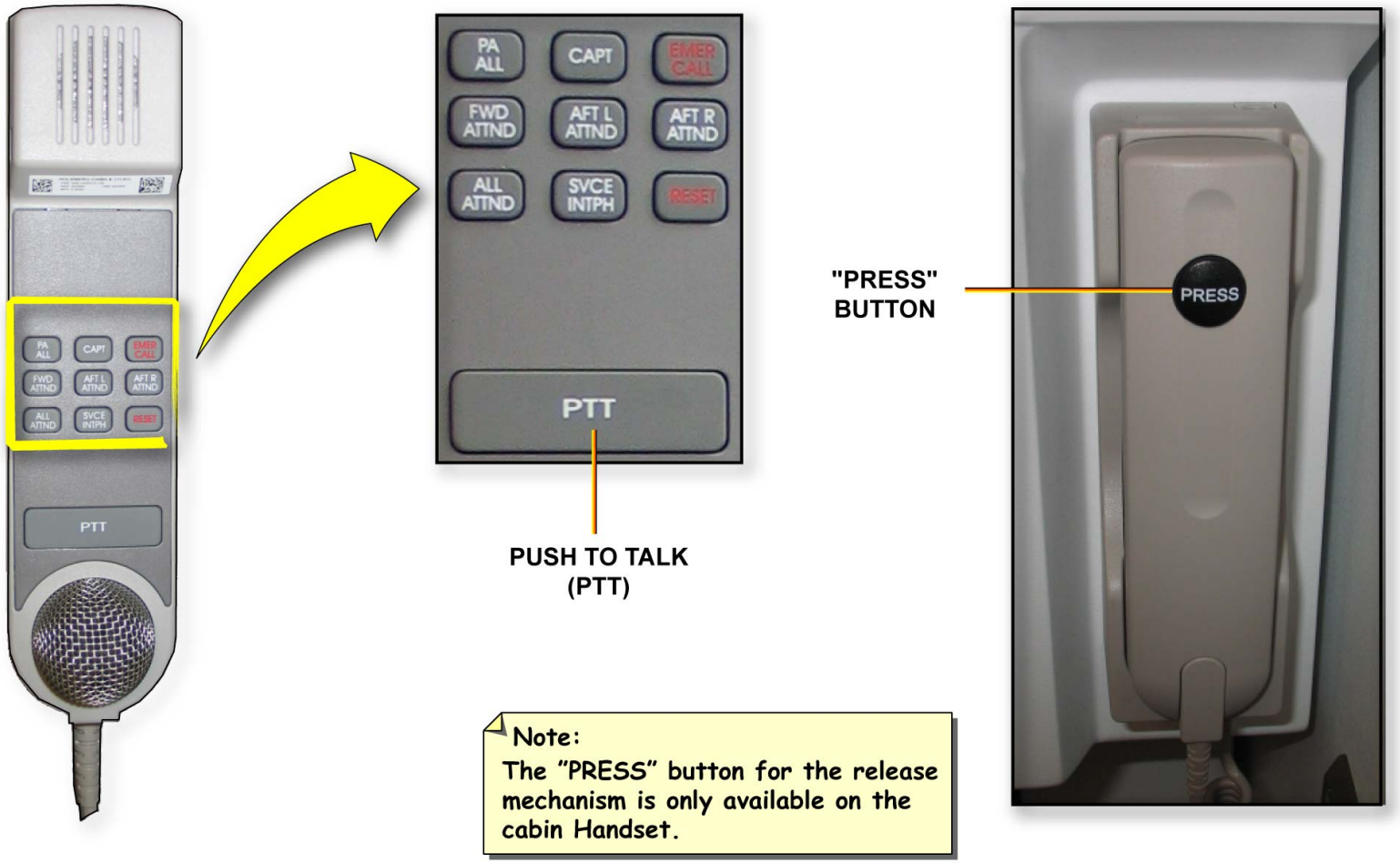

Note:
The "PRESS" button for the release mechanism is only available on the cabin Handset.

GENERAL & FUNCTION

PASSENGER ADDRESS SYSTEM DESCRIPTION (3)

GENERAL

The Cabin Intercommunication Data System (CIDS) directors (DIRs) accept audio signals from the various Passenger Address (PA) sources in the aircraft. The active DIR assigns priorities to each source. It transmits the signal in digital form via the two top-line data buses to the type A Decoder/Encoder Units (DEUs) and, optionally via the Passenger Entertainment System Main Multiplexer (PESMMUX), to each Passenger Control Unit (PCU). The type A DEUs send the signal to the cabin loudspeakers for broadcasting. The announcements can be heard, at each passenger seat, with a headset.

SOURCES

A PA announcement can be manually initiated from the cockpit and from the cabin. The announcement from the cockpit can be initiated with:
- the cockpit handset,
- other equipment: handmic, boomset mic, oxygen-mask mic in conjunction with the Audio Control Panels (ACPs),
- the No Smoking (NS) (or optionally EXIT) and Fasten Seat Belts (FSB) switches set to ON.

The announcement from the cabin can be initiated with:
- the attendant handsets,
- the Flight Attendant Panel (FAP); from which the prerecorded announcements, stored in the PRerecorded Announcement and Music (PRAM) flash card (optional) integrated into the FAP, can be selected and initiated, as the BoardinG Music (BGM). Instead of the flash card, PRAM-audio cassette/compact disc reproducer can be optionally installed.
- the Video Control Unit (VCU) if a video system is installed (optional).

A PA announcement can be automatically initiated from the PRAM when:
- the NS (or optionally EXIT) or FSB cockpit switches are set to AUTO and the landing gear is down and locked or slats and flaps are activated,
- a cabin decompression occurs.

PRIORITY

The basic levels of priority are the following ones:
- 1st priority: Flight compartment,
- 2nd priority: Cabin attendant stations,
- 3rd priority: Prerecorded announcement,
- 4th priority: BGM and/or entertainment system (if installed).

As an option the FWD attendant station could have the 2nd level of priority, in this case the other attendant stations will have the 3rd level of priority. The levels of priority and the defined options are programmed in the Cabin Assignment Module (CAM) flash card integrated into the FAP.

PA LEVEL

The CIDS transmits the PA announcements and the BGM to all passenger related loudspeakers. When an engine is running, the PA volume is increased automatically by + 6 dB, and by + 4 dB in the event of cabin depressurization, monitored by the Cabin Pressure Controller (CPC). The PA volume is also increased in case of a data bus failure (top line). If during a PA announcement the cockpit door is opened, there is a volume decrease of the PA announcement in the cockpit door area, to avoid a feedback with the cockpit. The CIDS gives the possibility to change the volume of chimes and announcements in all defined cabin areas independently. To change the settings in one area, the LEVEL ADJUSTMENT page must be selected on the FAP. The related Adjust button must be pushed on the LEVEL ADJUSTMENT page to open the related VOLUME ADJUSTMENT subpanel. To select the respective location the up/down buttons must be pushed on the VOLUME ADJUSTMENT subpanel. The volume of announcements and chimes is increased/decreased by pushing the related plus/minus button on the subpanel.

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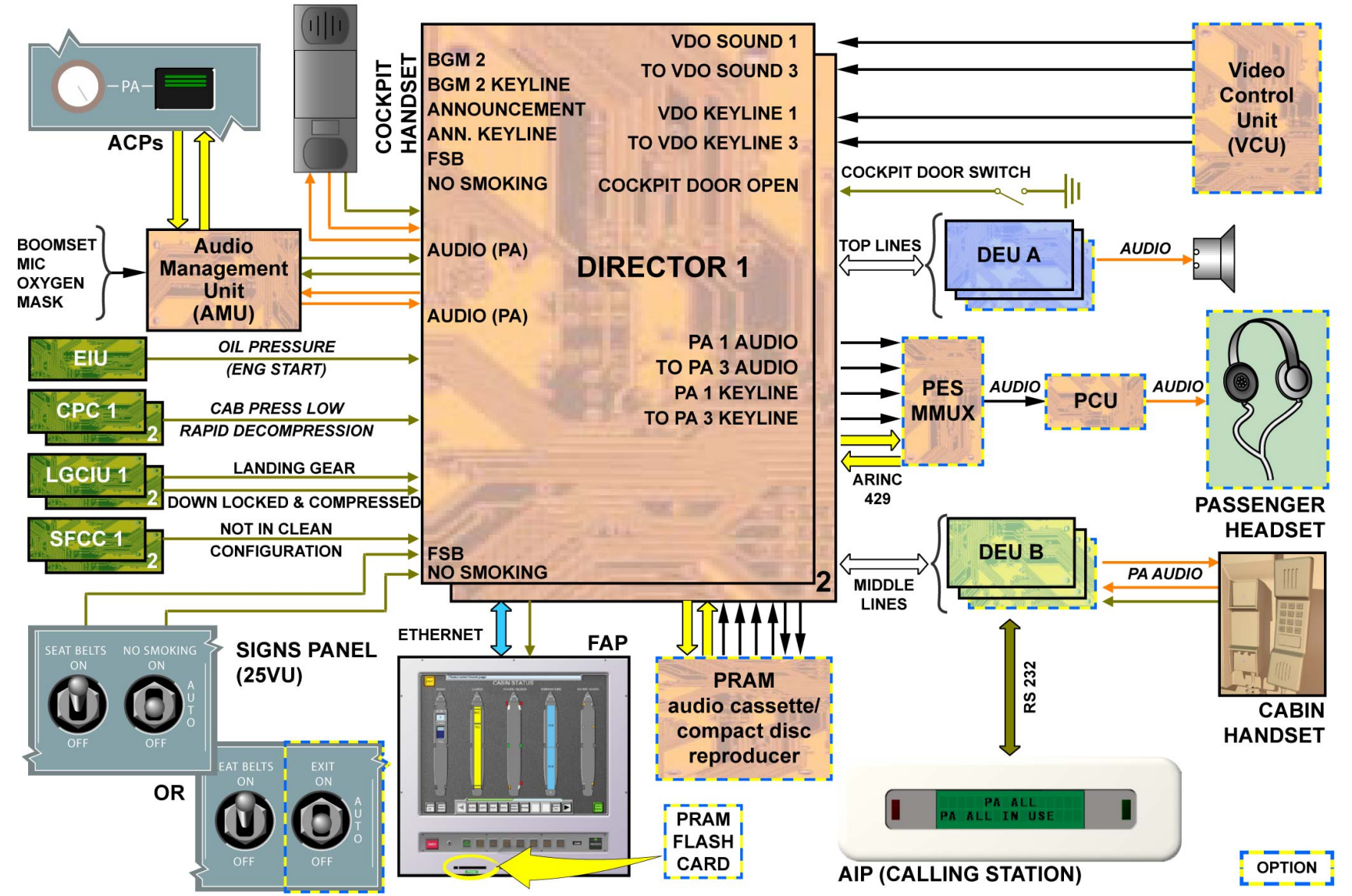

GENERAL ... PA LEVEL

PASSENGER ADDRESS SYSTEM OPERATION (3)

PASSENGER ANNOUNCEMENT FROM COCKPIT

HANDMIC

To select an announcement using the handmic, the Passenger Address (PA) transmission key located on the Audio Control Panel (ACP) must be pressed and held. It comes on green and connects the microphone audio to the PA system. Then, pressing the Push-To-Talk (PTT) SW on the mic, keys the PA system, overriding lower priority PA sources and broadcasting the speech through the cabin loudspeakers and the passenger (PAX) headsets. To get the side tone and to control the volume, when using the headset, the PA reception knob must be pressed and released. It comes on white. A "PA ALL IN USE" indication appears on all Attendant Indication Panels (AIPs).

BOOMSET/OXYGEN MASK

To make an announcement using the boomset or the oxygen mask, the PA transmission key must be pressed and held on the ACP. It comes on green. The handmic has also the same priority. To switch on the PA side tone, the PA reception knob must be pressed and released. It comes on white and controls the side tone volume. A "PA ALL IN USE" indication appears on all AIPs.

HANDSET

A handset is mounted on the cockpit center pedestal and contains a PTT SW. Pressing on the PTT SW keys the PA system, overriding lower priority PA sources and broadcasting the speech over all PA loudspeakers and PAX headsets. A "PA ALL IN USE" indication appears on all AIPs. The fastest way to make a PAX announcement from the cockpit is, to pick-up the handset, push the PTT SW and talk.

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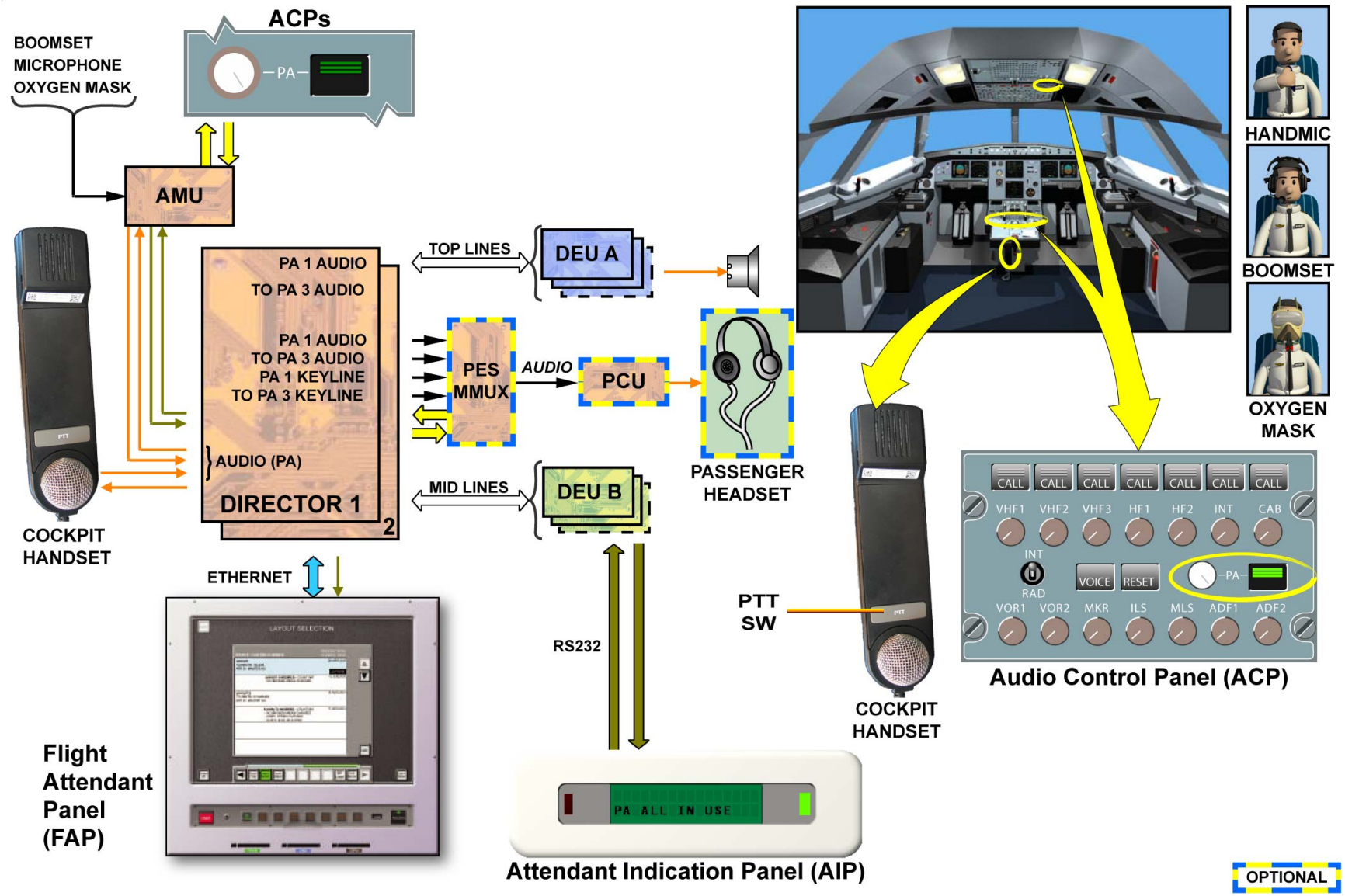

PASSENGER ANNOUNCEMENT FROM COCKPIT - HANDMIC ... HANDSET

PASSENGER ADDRESS SYSTEM OPERATION (3)

PASSENGER ANNOUNCEMENT FROM CABIN

The cabin can be split into a maximum of three cabin zones, depending on the airline options. This information is stored in the Cabin Assignment Module (CAM) flash card. The director uses it to identify the commands received from the cabin attendant handsets and to transmit the passenger announcements to the relevant cabin zone. An attendant handset is mounted at each attendant station. An AIP is installed near each handset for display of PA-use information. When the handset is lifted, a dialing tone (440 Hz) is heard. The top line of the AIP shows a sharp "#" symbol. When you press the PA ALL key, a confirmation message is shown on the AIP. If the PA call is impossible due to the priority of a call already in progress, then the word "BUSY" appears on the AIP display. To press the keypad RESET key always clears any handset operation and lets you make a new key selection. The numbers of all selectable PA zones and the respective keypad keys are stored in the CAM flash card. The CAM flash card also contains a priority list which is established if an announcement can be broadcasted. Once a PA call is established, the respective "PA IN USE" message is shown on the bottom line of all AIPs. Cockpit "PA IN USE" indicator, located on the calls panel is provided as an option. The PTT switch keys the PA system. Side tone audio is fed to the handset earpiece. When the PA announcement is over, you can disconnect the handset from the PA system as follows:
- put the handset into the cradle or,
- press the RESET button.

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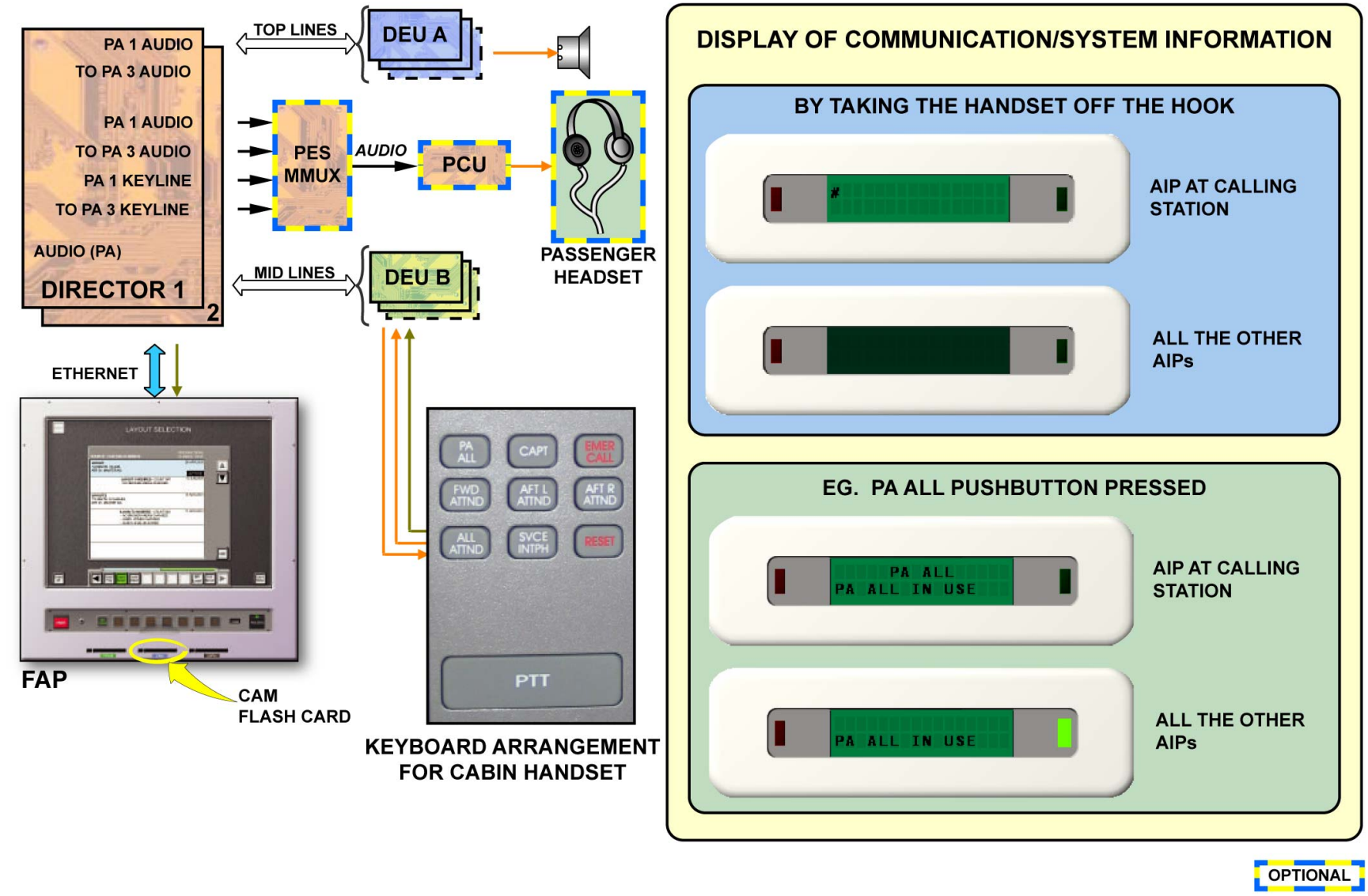

PASSENGER ANNOUNCEMENT FROM CABIN

CABIN INTERPHONE SYSTEM D/O (3)

GENERAL

The cabin and cockpit interphone system is used for the telephone communications between the ATTeNDant stations and, between the ATTND stations and the cockpit. A communication is always initiated by a dial procedure with the attendant handset or by pushbuttons on the CALLS panel in the cockpit.

SYSTEM DESCRIPTION

The Cabin Intercommunication Data System (CIDS) director (DIR) accepts audio signals from the various interphone sources in the aircraft and assigns priorities to each source. The DIR does telephone exchange switching and call functions from cockpit call switch settings or the attendant handset keypad entries. All this is done with reference to the parameters defined in the Cabin Assignment Module (CAM). Chimes are transmitted via the top line data bus and the DEU A to Passenger Address (PA) loudspeakers. In the cockpit, the amber light (flashing) on the ATTendant transmission key on the audio control panel annunciate interphone calls, accompanied by a buzzer sounds. In the cabin, the area call panels and Attendant Indication Panels (AIPs) are used for annunciation.

PRIORITY

All communication modes are handled with respect to the predefined priorities listed below:
- 1, emergency call,
- 2, call from cockpit including an all call from cockpit, and a normal call from cockpit,
- 3, all call from cabin station,
- 4, normal call from cabin station.

Additionally, all interphone sources have interrelated priorities, as assigned in the CAM. If more than one interphone source requests the same communication mode, the source with the higher priority will have preference. If they have the same priority, the interphone source which was dialed first will be given preference.

CALL FROM THE CABIN

Interphone communications are done with the attendant station handsets which are connected to the type B Decoder/Encoder Units (DEUs). To initiate a call, take the handset off the hook and then select the pushbutton on the keyboard. When the communication link is established, all the visual indications in the cabin are reset when the cabin handset is taken off its hook. All ATTND stations in the cabin have a RESET key to reset the interphone function, and proceeds to a new dialing.

CALL FROM THE COCKPIT

Calls from the cockpit are initiated from the CALLS panel which is connected to the DIRs. Connection of the cockpit to the cabin interphone system is done using the CABin key and knob on the audio control panels. The call pushbuttons on the CALLS panel let the crew select the ATTND station. On the A321, the CALLS panel has two additional pushbuttons:
- the MIDdle pushbutton is used by the crew to select the middle station,
- the EXIT pushbutton is used by the crew to select the exit station.

ALL ATTENDANT CALL (CONFERENCE CALL)

The conference mode is used for the communication between more than two interphone sources.

CALL FROM COCKPIT

When the ALL key is selected on the cockpit CALLS panel, all the called stations are switched to a common link to the calling station including cockpit.

NOTE: Optionally, two P/BSWs shall be installed near each cockpit crew to activate warnings in the cabin, in case of hijack, and shall have:
- distribution of special chime sequence via the cabin attendant loudspeakers,
- message on AIP,
- ACP attention indication,
- all visual indications limited in time to avoid any reset procedure.

CALL FROM CABIN

When the ALL ATTND key on the cabin handset is selected, all the called stations are switched to a common link to the calling station except the cockpit.

EMERGENCY CALL

CALL FROM COCKPIT

The EMERgency CALL pushbutton on the CALLS panel must be pressed in order to initiate an emergency call from the cockpit. This initiates a communication between the cockpit and all cabin stations on a common link.

CALL FROM CABIN

The EMER CALL key on one of the cabin ATTND handsets must be pressed in order to initiate an emergency call from the cabin. The calling handset only calls the cockpit.

CALL INDICATIONS

IN THE CABIN

When a call is initiated, visual indications are activated on the AIPs and area call panels, associated to the called station. High/low chimes are also broadcast in the assigned zones through the cabin loudspeakers.

IN THE COCKPIT

In case of an emergency call activation, the EMER CALL light on the cockpit CALLS panel and the amber ATT light on the audio control panels are activated, a buzzer is also broadcast. The aural and visual cockpit indications are reset with the RESET key on the audio control panel.

OPTIONS

CALL CHIME

When an ATTND station is called from another ATTND station or from the cockpit, the high/low chime can be broadcast from:
- the loudspeakers of the called ATTND station only,
- both all ATTND and passenger loudspeakers.

MODIFIED AREA CALL PANELS

Instead of two steady pink lights a steady green light can be triggered on the calling station area call panel. The steady green light is used for cabin ATTND to cabin ATTND calls or used for cabin information to advise the cabin crew that the cockpit is ready to take-off or land.

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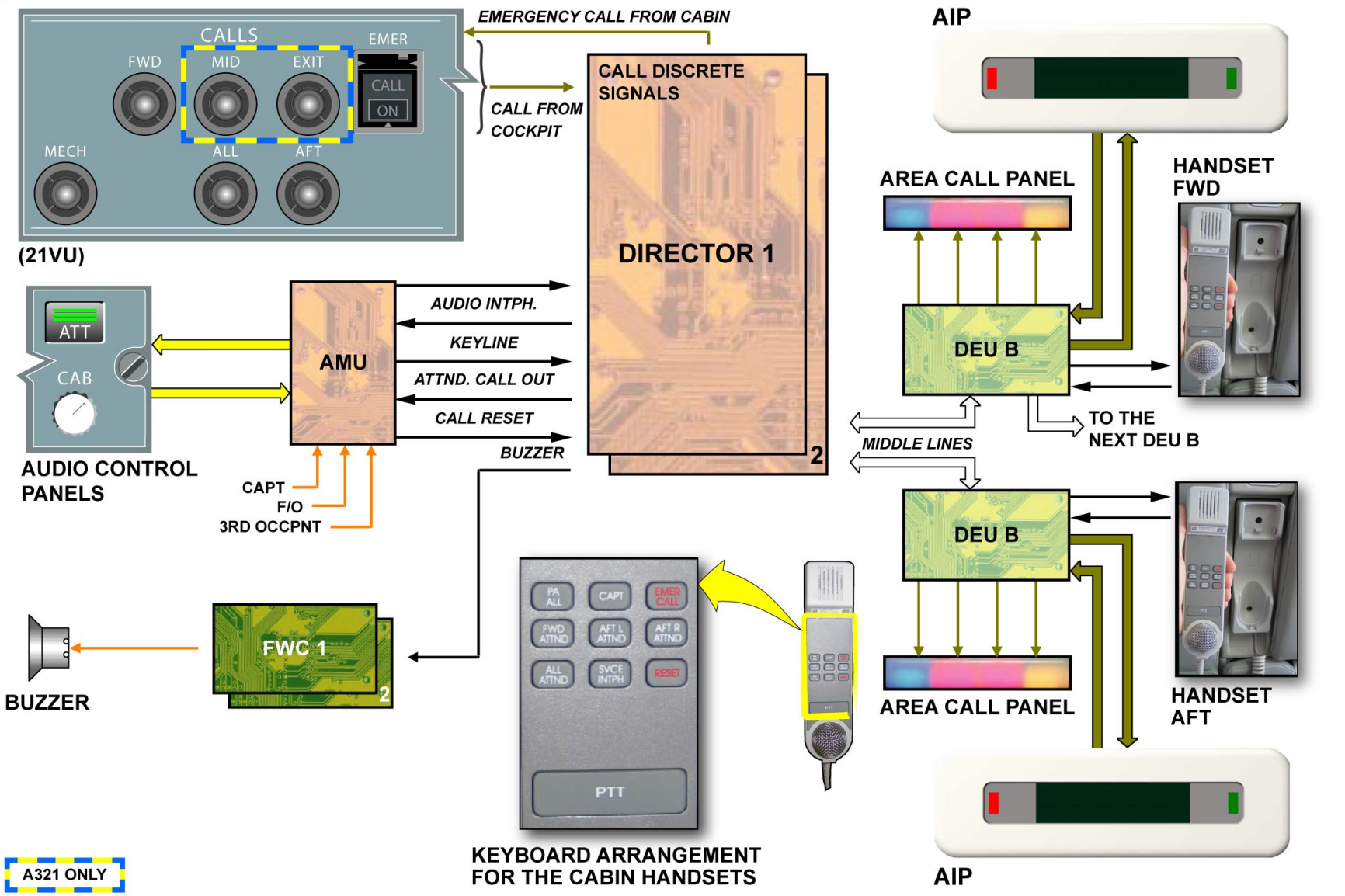

GENERAL ... OPTIONS

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SERVICE INTERPHONE D/O (3)

GENERAL

The SerViCE INTerphone SYStem is a voice communications system on the ground, between the flight crew and the ground service personnel. A communication can also be made between the attendant stations and the dedicated jacks around or in the aircraft.

SYSTEM DESCRIPTION

The SVCE INTPH SYS is made of:
- eight interphone jacks,
- a SVCE INTerphone OVerRiDe switch, with an integral indicator light located on the maintenance panel in the cockpit,
- five isolation units, If there is a short-circuit condition in a maintenance-interphone jack-socket, the isolation unit will keep the effects of the failure on the service interphone system to a minimum.

The audio lines from the cockpit, cabin and interphone jacks are routed to the amplifiers in both Cabin Intercommunication Data System (CIDS) directors.

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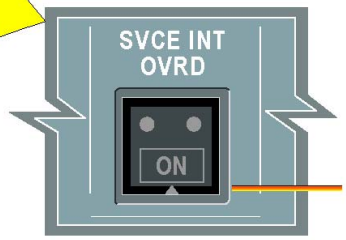
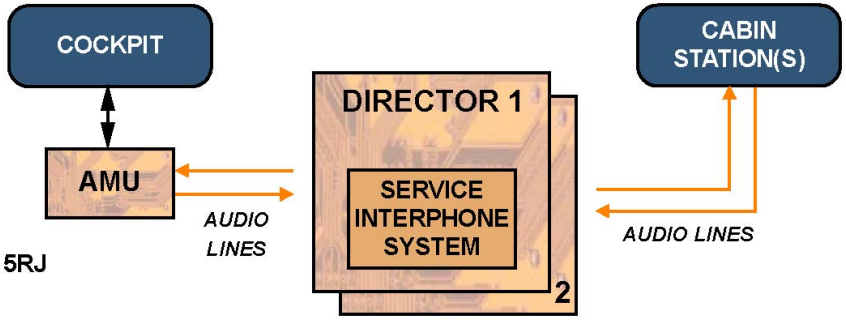
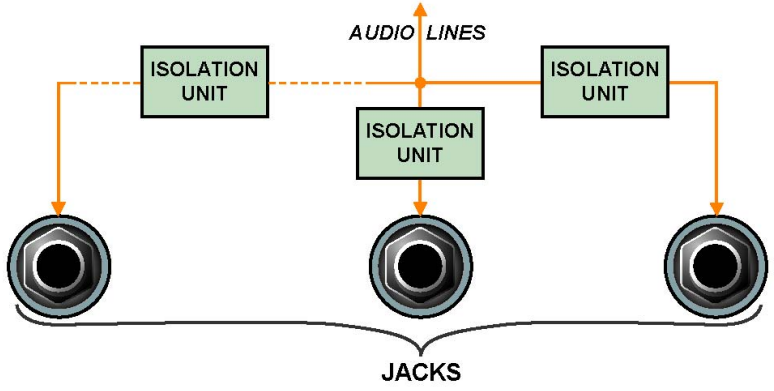
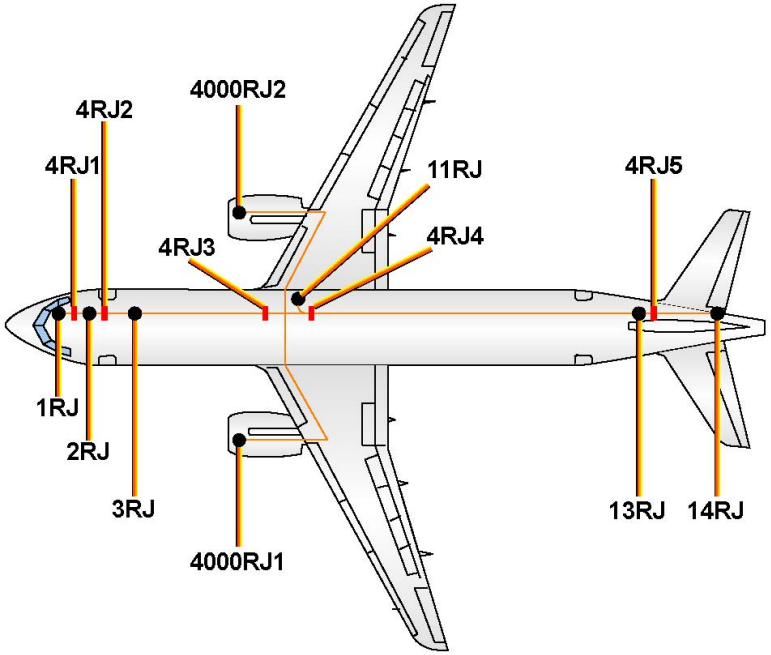
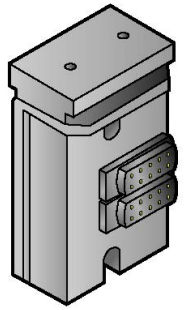










FIN	JACK LOCATION
1RJ	FWD AVIONICS COMPT
2RJ	LAT AVIONICS COMPT
3RJ	REAR AVIONICS COMPT
11RJ	AIR COND COMPT
13RJ	AFT FUSELAGE
14RJ	TAIL SECTION (APU BAY)
4000RJ1	ENGINE No 1
4000RJ2	ENGINE No 2

GENERAL & SYSTEM DESCRIPTION

SERVICE INTERPHONE D/O (3)

LGCIU AND SERVICE INTERPHONE OVERRIDE CONDITIONS

The SVCE INTPH SYS is integrated in the CIDS directors. There are 2 modes to connect the jacks to the SVCE INTPH.
The automatic mode:
On ground only, with the landing gear down and compressed. The Landing Gear Control and Interface Units (LGCIUs) send a ground signal to the SVCE INTPH SYS, integrated in the directors.
The manual mode:
The SVCE INT OVRD pushbutton, on the maintenance panel, must be pressed. Then the white ON light comes on. The aircraft is on the ground with no signal from the LGCIUs (e.g: The LGCIUs are not supplied). When the SVCE INT OVRD pushbutton is pressed or when the aircraft is on jacks, a ground signal is sent to the directors.

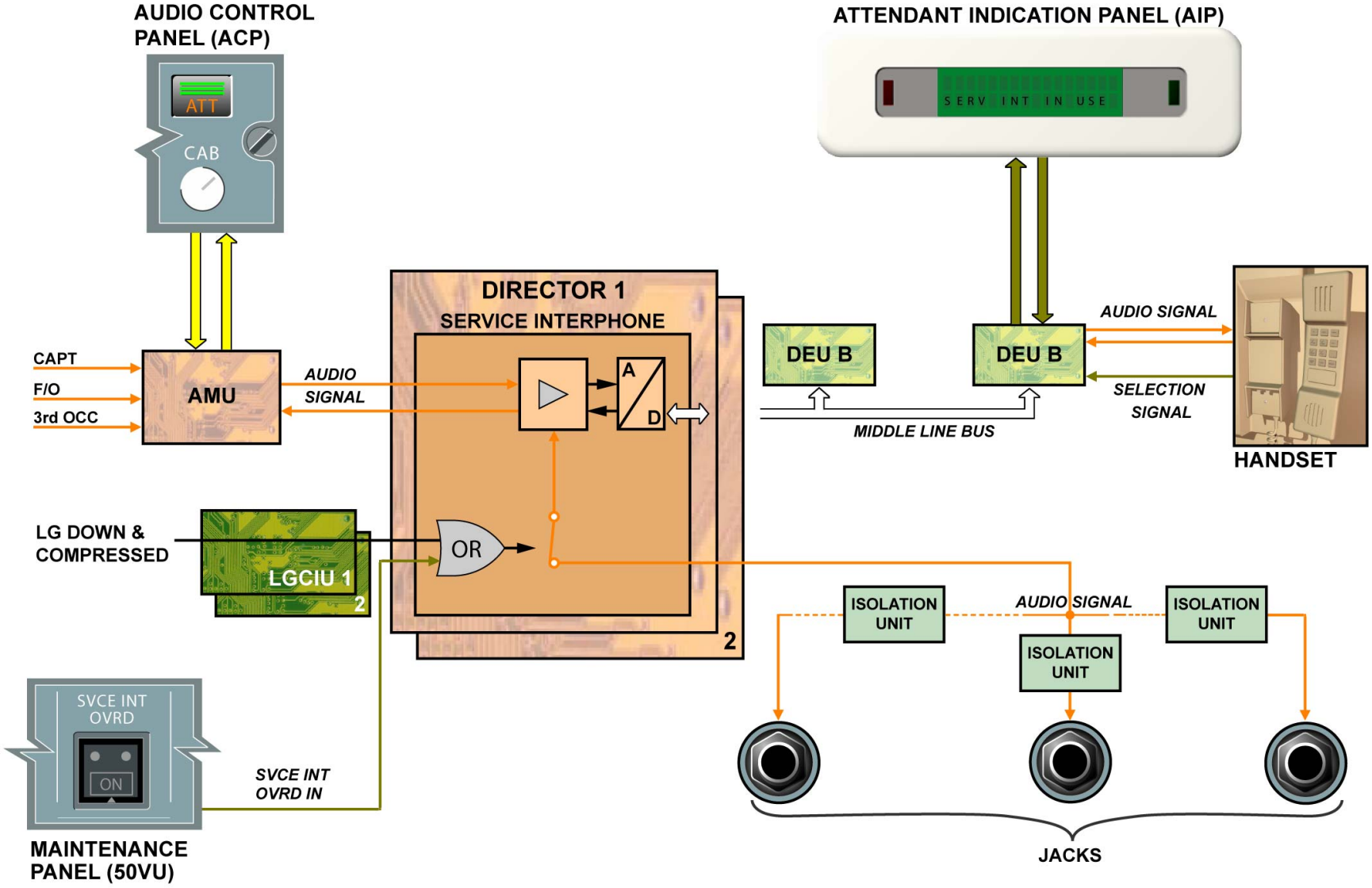
OPERATIONS FROM COCKPIT

To establish a speech communication from the cockpit with the SVCE INTPH jacks, the CABin key and knob on any Audio Control Panel (ACP), must be pressed. The audio signals are transmitted to the jacks through the Audio Management Unit (AMU), the SVCE INTPH SYS, integrated in the CIDS directors and the audio lines.

OPERATIONS FROM CABIN STATION(S)

To establish a speech communication from the cabin with the SVCE INTPH jacks, the SVCE key on the cabin attendant handset must be pressed. The message "SERV INT" is displayed on the calling station Attendant Indication Panels (AIPs). On all other AIPs, the steady "SERV INT IN USE" message appears. The audio signals are digitized through the type B Decoder/Encoder Units (DEUs) and transmitted through the middle data bus lines to the directors. After conversion to analog signals, they are transmitted to the jacks through audio lines.

NOTE: When the CAB and INT keys are pressed (respectively on the ACPs in the cockpit and on the handset in the cabin), speech communications can be established between the cockpit, the cabin stations and the jacks.



LGCIU AND SERVICE INTERPHONE OVERRIDE CONDITIONS ... OPERATIONS FROM CABIN STATION(S)

PASSENGER CALL SYSTEM D/O (3)

GENERAL

At Cabin Intercommunication Data System (CIDS) power-up a general call reset will be started. Any call started from a passenger seat or a lavatory activates aural and visual indications. If no passenger call is made during boarding time, all seat row numbering lights will be continuously lighted. If a passenger call is made during boarding time, the respective seat row numbering light will flash.

PASSENGER TO CABIN ATTND CALL FROM PASSENGER SEAT (ONE CABIN ZONE)

When a passenger (PAX) seat call P/B is pressed on the Passenger Service Unit (PSU):
- the associated seat row numbering light comes on,
- a high 1 chime is broadcasted over all attendant (ATTND) and PAX loudspeakers,
- the blue Light Emitting Diode (LED), on all Area Call Panels (ACPs) comes on continuously.

If several P/Bs are pressed simultaneously, a maximum of three chimes sound. The call indications associated with an activated P/B are reset when the same P/B is pressed a second time.

PASSENGER TO CABIN ATTND CALL FROM LAVATORIES (ONE CABIN ZONE)

Basic version: When a lavatory call P/B is pressed:
- the integrated call light comes on,
- a chime is broadcasted over all ATTNDs and PAX loudspeakers,
- the amber LED comes on continuously on the respective ACP,
- the respective lavatory call amber LED comes on.

Pressing the respective lavatory call P/B a second time resets the associated call indications.

OPTIONS

The following options could be embodied upon customer request:
- two zone PAX to cabin ATTND calls,
- three zone PAX to cabin ATTND calls,
- PAX to cabin ATTND call via cabin ATTND station loudspeakers only,
- central reset of PAX calls for all zones on the AUDIO page, on the Flight Attendant Panel (FAP),
- central reset of PAX calls zone wise, on the AUDIO page, on the FAP and on the Additional Attendant Panel (AAP),
- PAX call indication on Attendant Indication Panels (AIPs),
- chime inhibition for PAX to cabin ATTND calls.

Any of these options, once adopted, will be integrated in the Cabin Assignment Module (CAM) flash card into the FAP.

2/3 CABIN ZONES

When a passenger seat PAX call P/B is pressed on the PSU:
- the visual annunciation (blue) of a PAX to cabin ATTND call will be effective on the ACP assigned to the PAX compartment where the call has been initiated,
- the aural call annunciation (1 high chime) will be broadcasted via the cabin and ATTND loudspeakers assigned to the PAX compartment where the call has been initiated.

PASSENGER TO CABIN ATTND CALL VIA CABIN ATTND STATION LOUDSPEAKERS ONLY

The visual call annunciation will be effective on the ACP assigned to the PAX compartment where the call has been initiated. The aural call annunciation will be broadcasted via the cabin ATTND loudspeakers assigned to the PAX compartment where the call has been initiated.

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CENTRAL RESET OF PASSENGER CALLS FOR ALL ZONES FROM THE FAP

A specific Call Reset button for all PAX calls from all zones is localized on the AUDIO page on the FAP. Both aural and visual indications are reset when this P/B is pressed.

CENTRAL RESET OF PASSENGER CALLS ZONE WISE FROM THE FAP AND AAP

A central reset button for the forward section is localized on the AUDIO page on the FAP. A CALL RESET button for the aft section is installed on the AAP.

PASSENGER CALL INDICATION ON AIP

The seat row number with a LH or RH reference or the location of the respective lavatory will be shown in clear text on the AIPs. A second received call will be shown after reset of the first call, if more than one call if designed at any AIP. The respective indications disappear when the call has been reset by pushing the CALL button again. If two or three zone PAX calls are selected, the individual calls will be indicated only on the AIPs which are assigned to that particular PAX compartment call zone.

CHIME INHIBITION FOR PASSENGER TO CABIN ATTND CALLS

A chime Inhibit button is set on the AUDIO page on the FAP for chime inhibition. The button must be pushed in order to inhibit the call chimes. If the button is pushed again the call chime is activated again. Only the chime is inhibited, visual indications remain unaffected.

CALL FROM PCU

If a Passenger Entertainment System (PES) is installed in the aircraft with the Passenger Services System (PSS) embodied, a PAX to cabin ATTND call can be initiated from the Passenger Control Unit (PCU). The results of this call are the same as the one defined when the call is initiated from the PSU with all possible options.

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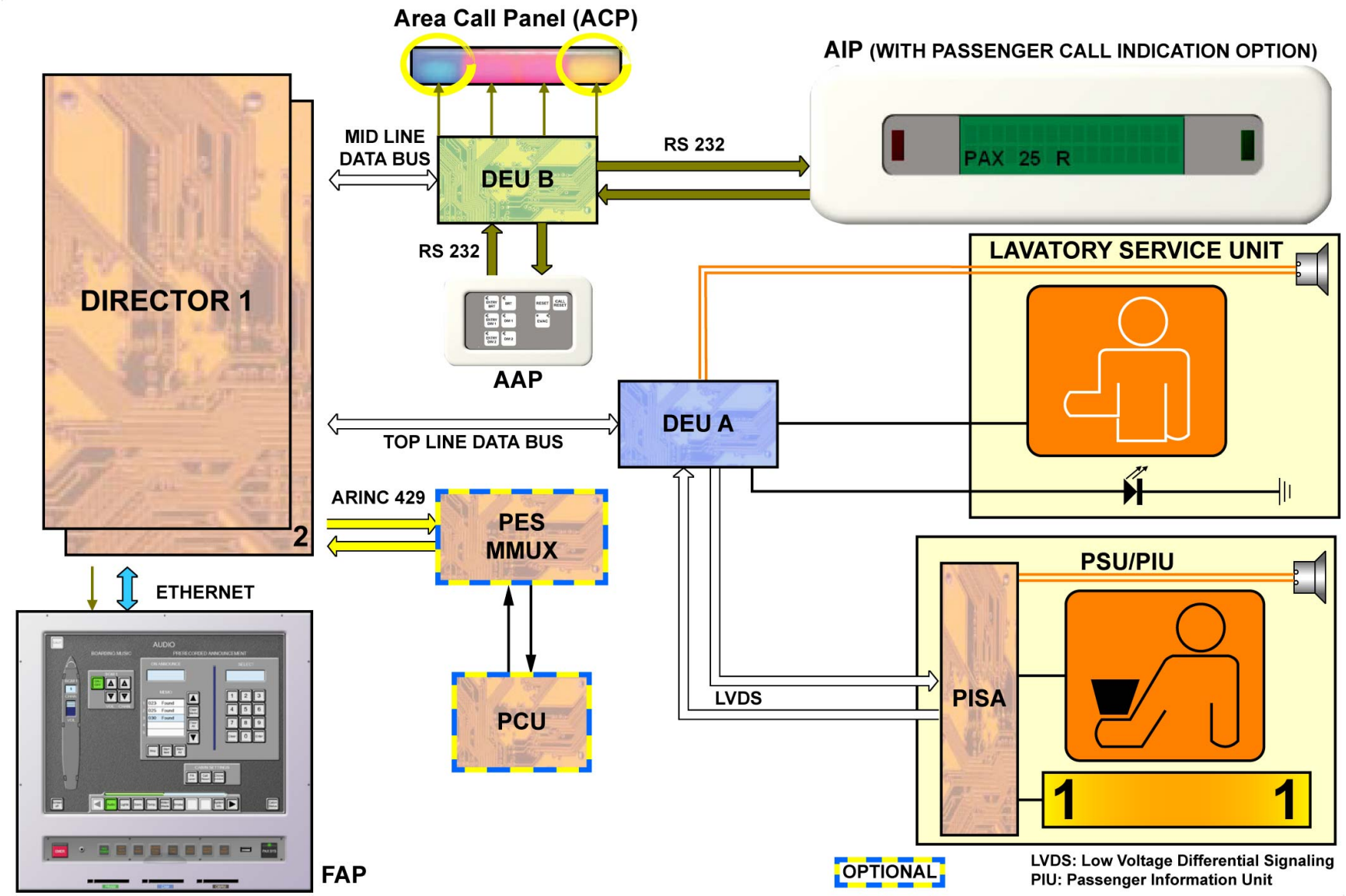

GENERAL ... OPTIONS

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PASSENGER LIGHTED SIGNS D/O (3)

GENERAL

EXIT signs lighting is achieved by a 3 position NO SMOKING SW (ON/AUTO/OFF) in the flight compartment for EXIT signs in the cabin. Fasten Seat Belt (FSB) and Return To Seat (RTS) signs lighting is achieved by a 2 position SEAT BELTS SW (ON/OFF) (AUTO third position in option) in the flight compartment for FSB signs in the cabin and the RTS signs in the lavatories.

NOTE: The option "Non Smoker aircraft at first power up" is standardized. The aircraft acts as a "Non-Smoker Aircraft" from the first flight on without any manual reprogramming. In this case all NS signs will be on at every power up. The non-smoker aircraft at power up will be set in the CAM as a default setting. On signs panel, the No Smoking SW can optionally be replaced by the EXIT SW.

NO SMOKING AND EXIT SIGNS

MANUAL MODE

In manual mode, the 3 position NO SMOKING SW installed in the flight compartment can be set in the ON/OFF position for activation/deactivation of the NS and EXIT signs. Visual indication: The NS at the seat rows and the EXIT signs are switched on/off. Aural indication: One low chime is broadcast via all passenger and all ATTeNDant loudspeakers when the signs are switched on/off. All the NS signs (including cabin crew NS signs) can be switched on by selecting the NON SMOKER A/C button on the CABIN PROGRAMMING page of the Flight Attendant Panel (FAP), all NS and attendant NS signs are switched on, regardless of the position of the cockpit switches. This does not affect the EXIT signs.

AUTOMATIC MODE

For the automatic mode, the 3 position NO SMOKING SW installed in the flight compartment has to be set in the AUTO position. When the landing gear is down and locked the NS and EXIT signs are switched on. The visual and aural indications are the same as in the manual mode.

FASTEN SEAT BELT AND RETURN TO SEAT SIGNS

MANUAL MODE

The 2 positions SEAT BELTS SW installed in the flight compartment can be set in the ON/OFF position for activation/deactivation of the FSB and RTS signs. Visual indication: The FSB signs at the seat row signs and the RTS signs at the lavatories are switched on/off. Aural indication: One low chime is broadcast via all cabin and all ATTND loudspeakers when the signs are switched on/off.

AUTOMATIC MODE

There is no automatic mode in the basic version.

NOTE: The AUTO third position is available as an option on the SEAT BELTS SW and the signs will, normally be activated at SLAT/FLAP extension, if in AUTO position.

EXCESSIVE ALTITUDE

In case of excessive altitude the FSB, and the EXIT signs switch on automatically.

OPTIONS

The following options can be embodied upon customer request:
- flashing mode of passenger lighted signs,
- chime activation at signs "ON" operation only,

- automatic FSB signs control at landing gear down and locked,
- automatic FSB signs control when slats and flaps are activated,
- automatic NS signs control when slats and flaps are activated,
- combined NS/seat row numbering signs.

Any of these options, once adopted, will be integrated in the Cabin Assignment Module (CAM) flash card.

FLASHING MODE OF PASSENGER LIGHTED SIGNS

The FSB and NS will flash for approximately five seconds, when the related switches in the flight compartment are set to the ON position. After expiration of this time period the signs will remain on and steady until they are switched off.

CHIME ACTIVATION AT SIGNS ON OPERATION ONLY

The passenger attention low-chime broadcast through the passenger and cabin attendant station loudspeakers will be started only when the FSB or the NS signs are switched on.

AUTOMATIC FASTEN SEAT BELT SIGNS CONTROL AT LANDING GEAR DOWN AND LOCKED

The FSB signs in the passenger compartment and the RTS signs in lavatories will come on if the SEAT BELTS SW in the flight compartment is in the AUTO position and the landing gear is down locked.

AUTOMATIC FSB SIGNS CONTROL WHEN SLATS AND FLAPS ARE ACTIVATED

The FSB signs in the passenger compartment and the RTS signs in lavatories will come on if the SEAT BELTS SW in the flight compartment is in AUTO position and the slats and flaps are activated.

AUTOMATIC NS SIGNS CONTROL WHEN THE SLATS AND FLAPS ARE ACTIVATED

The NS signs in the passenger compartment will come on if the NO SMOKING SW in the flight compartment is in the AUTO position and the slats and flaps are activated.

COMBINED NS/SEAT ROW NUMBERING SIGNS

A combined NS and seat row numbering sign will be installed in each Passenger Service Unit (PSU). The additional NS signs are activated in parallel to the basic signs available on the PSUs.

NO ELECTRONIC DEVICE SIGNS

At customer request, the NS signs can be replaced by the no electronic device signs.

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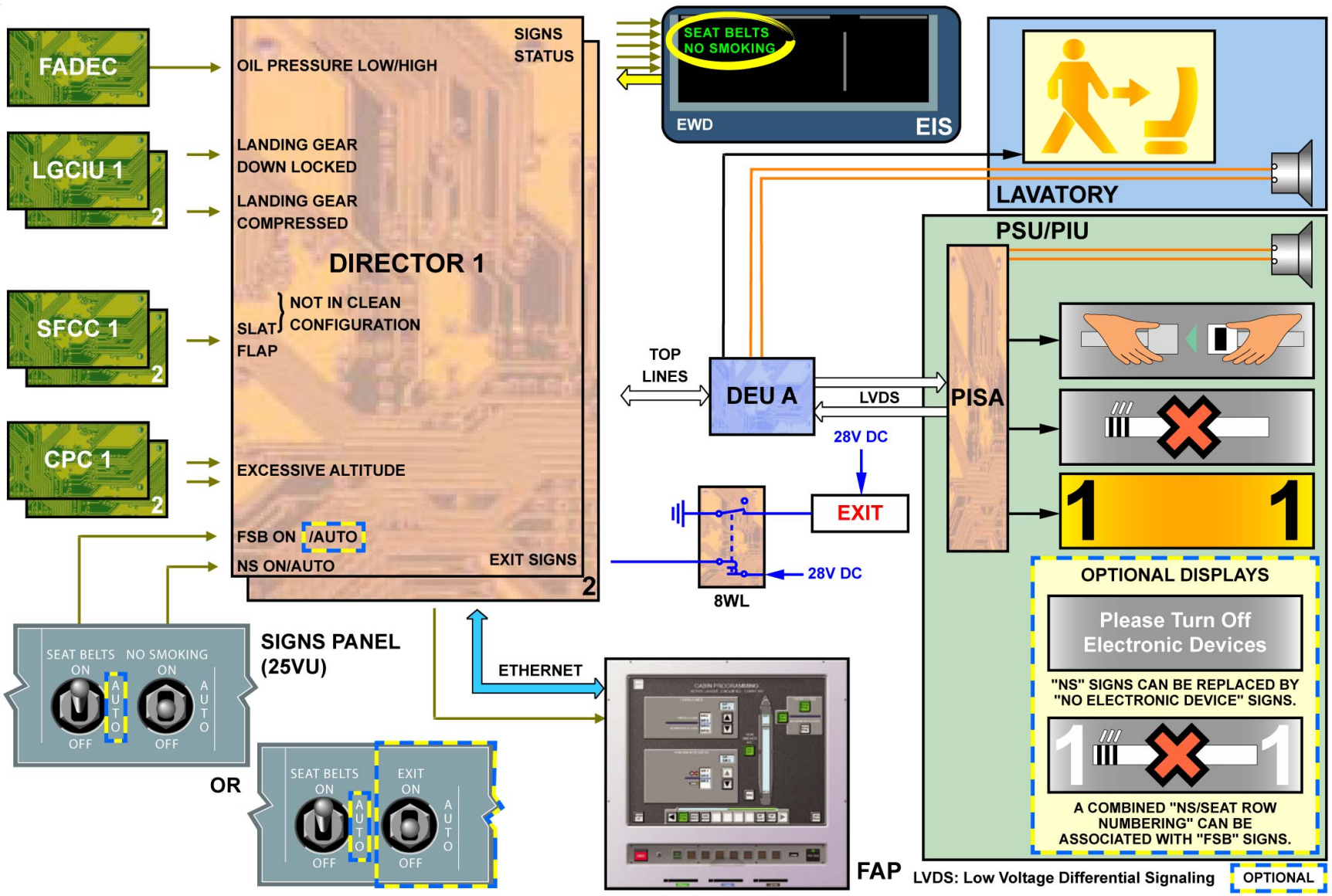

GENERAL ... OPTIONS

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PRERECORDED ANNOUNCEMENT & BOARDING MUSIC (3)

GENERAL

The PRerecorded Announcement and Music (PRAM) can be a flash card type, directly plugged into the Flight Attendant Panel (FAP), or an audio cassette/compact disc audio reproducer type. The function of the PRAM is to play prerecorded messages. It also plays BoardinG Music (BGM) programs to the passengers through the aircraft Passenger Address (PA) system. The selection of prerecorded announcement and/or boarding music is made on the AUDIO page of the FAP installed in the cabin at the forward attendant station. The PRAM audio reproducer is installed in the after avionics compartment, connected with ARINC 429 data buses to the Cabin Intercommunication Data System (CIDS) active director to receive and transmit control data. The FAP, including the PRAM flash card is linked to the CIDS director via ethernet bus. The Full Authority Digital Engine Control (FADEC) interface is for an automatic audio level increase (+ 6 dB) at engine start. The Cabin Pressure Controller (CPC) interface is for automatic announcement and audio level increase (+ 4 dB) in case of cabin depressurization.

PRERECORDED ANNOUNCEMENTS

The prerecorded announcements can be stored in different media, as tape, compact disc or flash card. The PRAM has the capability to produce an emergency announcement in the event of a rapid cabin decompression thanks to a ground signal from the rapid decompression sensor. All the functions are remotely controlled from the AUDIO page on the FAP, except the output level of normal and emergency announcements for audio cassette/compact disc audio reproducer type. They are adjustable at the front of the reproducer.

BOARDING MUSIC

There are two sources for the BGM: The PRAM audio reproducer or flash card and the Passenger Entertainment System (PES) audio reproducer. The PES music (or video) is a cabin distribution network, which supplies the In-Flight Entertainment (IFE) and the Passenger Service System (PSS) functions to the passenger seats. The IFE transmits all installed audio programs and video sounds to the passengers. In addition, the director transmits PA announcements to the IFE. On the FAP, the PAX SYStem key let switch the power distribution of the IFE system on/off. The IFE transmit the PA announcement to the headsets and the passenger can hear the audio programs through the headset connected to the jack on the Passenger Control Unit (PCU).

OPTIONs

The No Smoking (NS) and Fasten Seat Belt (FSB) announcements can be stored in the PRAM and can automatically be broadcast through the PA system in the cabin when the NS and FSB switches are set to AUTO position in the cockpit, and the landing gear and/or flaps/slats conditions are met, through respectively the Landing Gear Control and Interface Unit (LGCIU) and the Slat Flap Control Computer (SFCC).

FLASH CARD

PRERECORDED ANNOUNCEMENTS OPERATION

The PRAM is controlled from the AUDIO page of the FAP, which gives access to the prerecorded announcement messages:
- Play All, key and display to start all previously entered announcements,
- Play Next, key and display to start the announcement which has been entered in the first input field,
- Stop, key and display to terminate previously started announcement.

The activation of a prerecorded announcement sends a "PA IN USE" message to the Attendant Indication Panel (AIPs).

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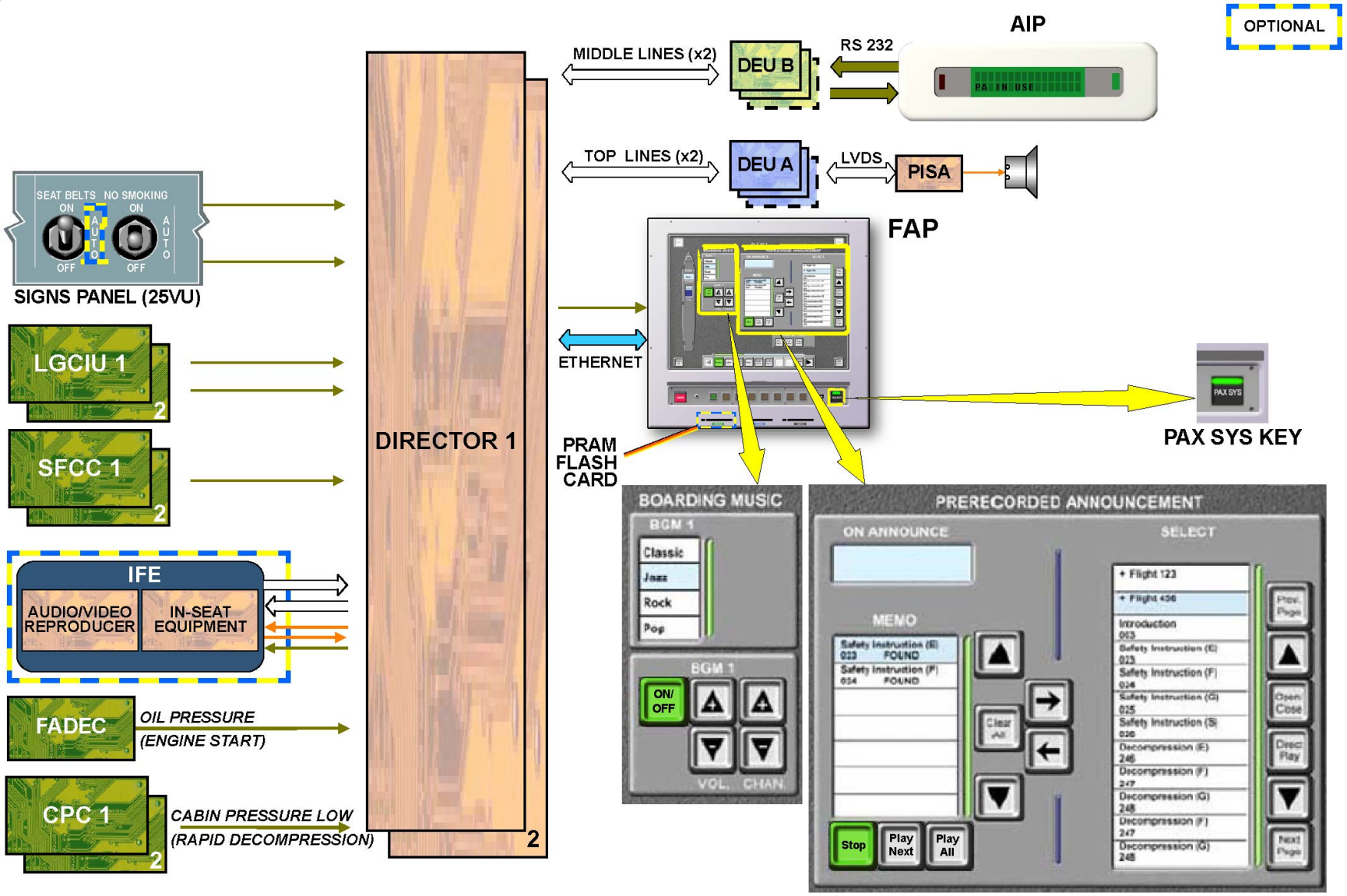
BGM OPERATION

The BGM is controlled from the AUDIO page of the FAP, which gives access to the BGM:

- ON/OFF button and indication, to start or stop BGM operation,
- CHANnel select buttons, with channel display to choose the channel,
- VOLume control buttons, with volume display to adjust the volume.



GENERAL ... FLASH CARD

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PRERECORDED ANNOUNCEMENT & BOARDING MUSIC (3)

CASSETTE/COMPACT DISC AUDIO REPRODUCER

PRERECORDED ANNOUNCEMENTS OPERATION

The PRAM is controlled from the AUDIO page of the FAP, which gives access to the prerecorded announcement messages:
- when the Enter button is pushed, the cursor moves into the MEMO 1 position. The required message is keyed-in on the keyboard and appears on the MEMO 1 display. When the Enter button is pushed again, the keyed-in data is accepted. The required messages for the MEMO 2 or 3 (4, 5, 6) displays are keyed-in the same as for the MEMO 1 display,
- when the cursor has moved into the related position (MEMO 1, 2, 3, 4, 5, 6) and the Clear button is pushed, the display clears,
- when the Play Next button is pushed the message shown on the MEMO 1 display moves up to the ON ANNOUNCE display. The MEMO 2 display message then moves up to the MEMO 1 display. The message shown on the MEMO 3 display moves up to the MEMO 2 display (etc...),
- when the Play All button is pushed, all messages keyed on MEMO 1, 2, 3, 4, 5, 6 will be announced continuously until the last announcement has finished,
- when the Stop button is pushed, the message announcement stops immediately.

BGM OPERATION

The BGM is controlled from the audio page of the FAP, which gives access to the BGM:
- ON/OFF button and indication, to start or stop BGM operation,
- CHANnel select buttons, with channel display to choose the channel,
- VOLume control buttons, with volume display to adjust the volume.

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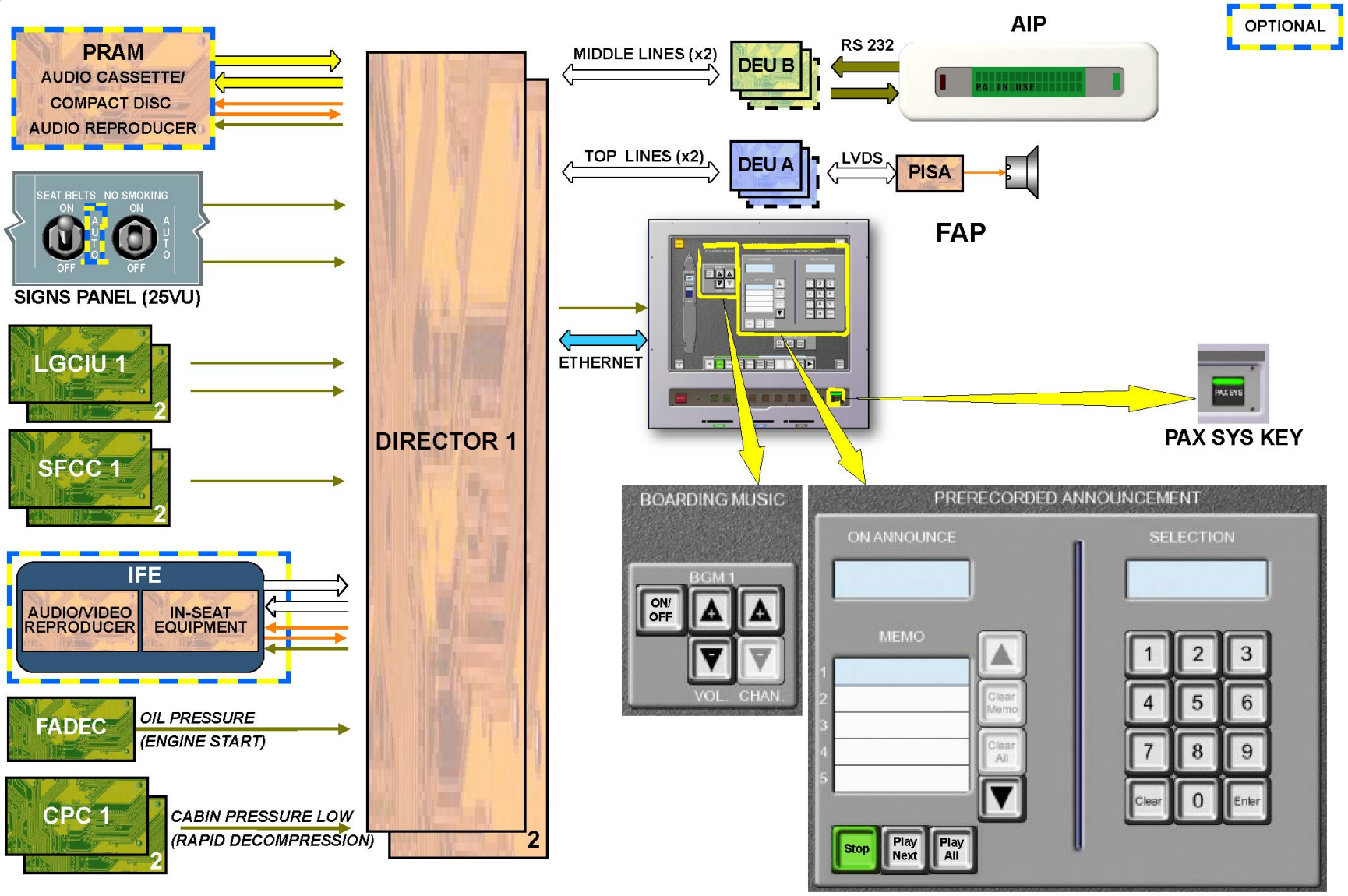

CASSETTE/COMPACT DISC AUDIO REPRODUCER - PRERECORDED ANNOUNCEMENTS OPERATION & BGM OPERATION

CIDS EVACUATION SIGNALLING D/O (3)

GENERAL

The EVACuation signaling system is used to send aural and visual signals in the cabin and in the cockpit for evacuation, following a request from the flight crew or attendants if an emergency condition should happen. The system can be controlled either from the cockpit or from the cabin.

COCKPIT CONTROL

In the cockpit, a control panel and a horn for aural indications are installed. The EVAC control panel contains:
A COMMAND guarded P/BSW to start the signaling or for a complete reset with two labels:
- EVAC: Which flashes red when the system is activated,
- ON: Which comes on white when the P/BSW is pressed in.

A HORN SHUT OFF P/B to silence the horn in the cockpit.
A two positions switch:
- CAPT & PURSer is used to trigger the system either from the cockpit or the cabin,
- CAPT: The system can only be triggered from the cockpit.

CABIN CONTROL

In the cabin, the system can be controlled from the Flight Attendant Panel (FAP), the Additional Attendant Panel (AAP) or the switch panel. The system configuration is defined by each customer. The following keys are used for this purpose:
- EVAC RESET (on FAP), RESET (on AAP and/or switch panel): Cancels the evacuation tone in the related door area attendant loudspeakers,
- EVAC ComManD (on FAP) or EVAC (on AAP and/or switch panel): Signals the EVAC signaling activation (EVAC alert signal),
- EVAC CMD (on FAP) or CMD (on AAP): Is used to activate the EVAC signaling and to show an EVAC COMMAND indication.

NOTE: The CMD key available on the AAP is installed as an option.

ACTIVATION FROM THE COCKPIT

The system can be activated by using the COMMAND guarded P/BSW on the EVAC panel 21VU installed on the overhead panel. The following indications will happen:
- the EVAC indicator light in the COMMAND P/BSW flashes in red,
- the ON indicator light in the COMMAND P/BSW switch comes on white,
- the EVAC horn gives an intermittent signal.

On the FAP, on the AAP, and on the switch panel:
- the EVAC RESET button and EVAC indicator light flash in red on the respective FAP hard key panel, AAP, and switch panel.

From the attendant loudspeakers:
- the EVAC tone is heard as an intermittent signal.

On all the Attendant Indication Panels (AIPs) the "EVACUATION ALERT" message is shown associated with flashing red light. In this configuration, only one of the following actions can be done at a time:
- by using the EVAC COMMAND P/BSW, all messages are cancelled in the cockpit and in the cabin,
- by using the EVAC HORN SHUT OFF, the EVAC horn is silenced,
- by using, the 'EVAC/RESET' button on the FAP hard key panel or the "RESET" buttons on the AAP or on the switch panel causes that all visual and acoustic indications in the related cabin zone are cancelled.

The EVAC/RESET button on FAP hard key panel and the EVAC indication on the AAP and/or switch panel are illuminated until the initial station cancels the EVAC command.

ACTIVATION FROM THE CABIN

IN COCKPIT: SWITCH TO CAPT & PURS POSITION

IN THE COCKPIT: SWITCH TO CAPT & PURS POSITION:

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The system can be activated from the forward attendant station by using the FAP EVAC CMD button, or from the other stations by using the CMD AAP key. When the EVAC CMD button or CMD key is pressed, the following alerts will happen:
- on the overhead panel, the EVAC indicator light in the COMMAND P/BSW flashes,
- in the cockpit, the EVAC horn broadcasts an intermittent signal,
- on the FAP, the EVAC CMD button light comes on green, and the EVAC RESET button comes on red and flashes,
- on the related AAP, the CMD indicator light in the key comes on green, and the EVAC indicator light comes on red,
- on the Switch Panel, the EVAC indicator light comes on red
- the EVAC signaling tone sound as an intermittent signal from all attendant loudspeakers,
- on all the AIPs, the "EVACUATION ALERT" message comes on and the red indicator light flashes.

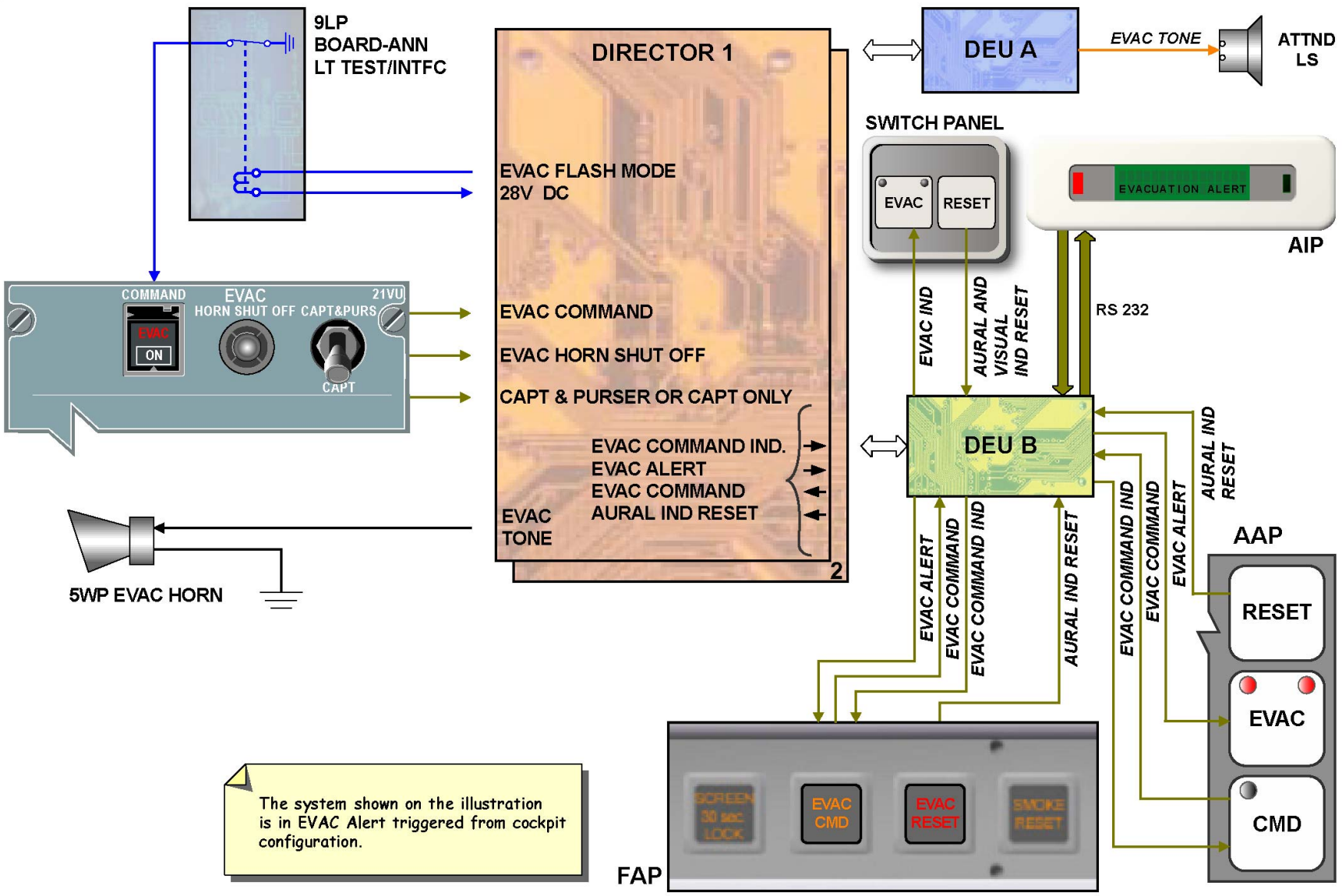
In this configuration, only one of the following actions can be done at a time:
- pressing the EVAC RESET button on the FAP or RESET key on the AAP and/or on the switch panel, resets all visual and aural indications in the related zone,
- pressing the EVAC COMMAND P/BSW in the cockpit, or the EVAC CMD on the FAP, or the CMD key on the AAP, cancels all EVAC messages in the cockpit and in the cabin.

IN COCKPIT: SWITCH TO CAPT POSITION

IN THE COCKPIT: SWITCH TO CAPT POSITION
When one of the EVAC CMD button on the FAP or CMD key on the AAP is selected in the cabin, the following alerts happen:
- the EVAC CMD button light on the FAP, and the CMD key indicator light on the AAP come on green,
- the EVAC indicator light of the switch panel flashes,
- the EVAC red indicator light in the COMMAND P/BSW, on the overhead panel 21VU, flashes,
- the EVAC horn broadcasts in the cockpit, an intermittent signal for approximately 3 seconds.

In this case, the pilots will decide if the evacuation alert has to be activated. If there is no activation by the crew members, in this configuration:
- pressing the EVAC CMD button on the FAP or CMD key on the AAP a second time, cancels the green indicator light on the panels, the EVAC message and the horn in the cockpit.

NOTE: The system shown on the illustration is in EVAC Alert triggered from cockpit configuration.



GENERAL ... ACTIVATION FROM THE CABIN

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CIDS WARNINGS (3)

GENERAL

The indication of the failures depends on their importance. On the Flight Attendant Panel (FAP), there is a Cabin Intercommunication Data System (CIDS) CAUTion light in the upper left corner of the touchscreen. It is normally off. The CAUT light comes on amber and flashes when the active director (DIR) detects a fault that needs cabin crew action. The action needed is shown in the heading row (e.g. Please select Doors page). When you select the page, the CAUT light stops flashing and remains on continuously. If the fault is cleared the CAUT light goes off. For some faults, the required page is automatically shown on the FAP, there can also be a blue card message. This is a blue rectangle with a fault message written in amber. Major CIDS faults (class 1) are also indicated to the flight crew with Flight Warning System (FWS) level 2 or level 1 alerts. All CIDS faults generate Centralized Fault Display System (CFDS)/MCDU class 1, 2, 3 messages. Contrary to cockpit indications, the FAP failures indications do not depend on flight phases.

NOTE: The STATUS page does not appear automatically after a warning.

MAJOR CIDS FAULTS (CLASS 1)

Class 1 CIDS faults are:
- CIDS DIR 1 and 2 fault,
- a top line bus failure,
- a middle line bus failure,
- 25 % of Decoder/Encoder Units (DEUs) type A failed,
- 50 % of DEUs type B with failed connected handsets.

In each case the cockpit display will be:
MASTER CAUT light (amber), single stroke chime, and an ECAM message CIDS 1+ 2 FAULT on the EWD (inhibited in flight phases 3, 4, 5, 7 and 8). CIDS 1+2 message will be added to the INOP SYStem list on the ECAM STATUS page. Class 1 faults are recorded in the CFDS LAST/CURRENT LEG REPORT and the POST FLIGHT REPORT.

NON CRITICAL CIDS FAULTS

Non critical CIDS faults (e.g. Cabin Assignment Module (CAM) layout transmission failure) have no flight crew related effects, so there are no 'in flight' cockpit alerts. In most cases there is no FAP CAUT and/or message. However some of these faults are class 2 maintenance faults only. The cabin crew is not alerted, but these class 2 faults are indicated to the cockpit crew in flight on the ECAM STATUS page after manual selection and are the subject of an ECAM report (POST FLIGHT REPORT...) on the ground after engines shutdown. The ECAM STATUS page shows MAINTENANCE CIDS 1 (2).

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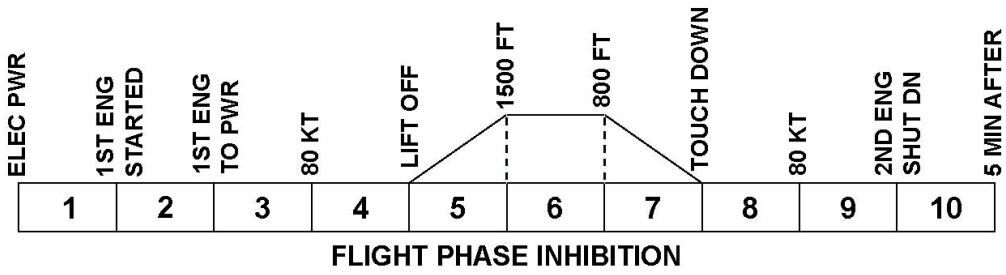

FLIGHT PHASE INHIBITION

FAILURE	AURAL WARNING	MASTER CAUTION LIGHT	FAP CAUTION LIGHT	MESSAGE on FAP	ECAM (EWD) MESSAGE	FLIGHT PHASE INHIB
DIRECTOR Director, internal failure, other director not OK	SINGLE CHIME	ON	ON	CHECK ATTENDANT AND PAX RELATED FUNCTIONS [PA/INTPH/SIGNS/ PAX CALL/LIGHTS]	CIDS 1+2 FAULT	3, 4, 5, 7, 8 (ONLY FOR COCKPIT WARNINGS)
One TOP LINE One TOP LINE failure				CHECK PAX RELATED FUNCTIONS [PA/SIGNS/ PAX CALL/LIGHTS]		
DEU A 10% of all DEU-A's						
One MIDDLE LINE One MIDDLE LINE failure				CHECK ATTENDANT RELATED FUNCTIONS [PA/INTPH/PAX CALL]		
DEU B 50% of DEU-B's with connected handset						

GENERAL ... NON CRITICAL CIDS FAULTS

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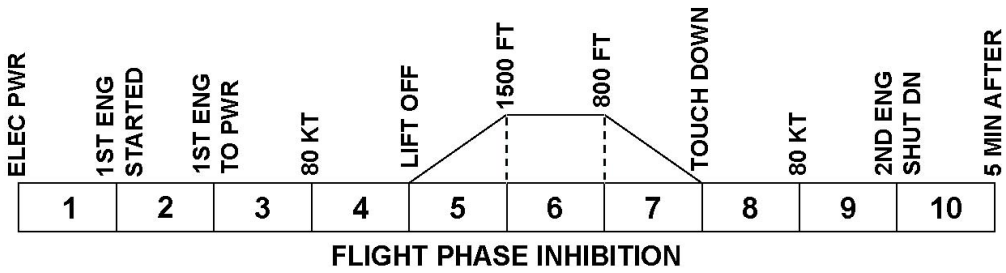

FAILURE	AURAL WARNING	MASTER CAUTION LIGHT	FAP CAUTION LIGHT	MESSAGE on FAP	ECAM STATUS MESSAGE	FLIGHT PHASE INHIB
DIRECTOR Director, internal failure, other director OK	NIL	NIL	NIL	NIL	MAINTENANCE CIDS 1 (2)	—
Passive director receives no data from FAP	NIL	NIL	NIL	NIL	MAINTENANCE CIDS 1 (2)	
Director working with the mandatory layout, other Director OK	NIL	NIL	NIL	NIL	MAINTENANCE CIDS 1 (2)	
CAM CAM layout transmission fail to passive Director	NIL	NIL	NIL	NIL	MAINTENANCE CIDS 1 (2)	
CAM layout transmission fail to active Director	NIL	NIL	ON	CHK ATT & PAX RELATED FUNCTIONS	NIL	
CAM failure by passive Director	NIL	NIL	NIL	NIL	MAINTENANCE CIDS 1 (2)	
Passive director receives no data from CAM	NIL	NIL	NIL	NIL	MAINTENANCE CIDS 1 (2)	
FAP FAP no data from passive Director	NIL	NIL	NIL	NIL	MAINTENANCE CIDS 1 (2)	

GENERAL ... NON CRITICAL CIDS FAULTS

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CIDS DIRECTOR INTERFACES (3)

GENERAL

Here is the list of director (DIR) interfaces described in this module:
- Centralized Fault Display Interface Unit (CFDIU),
- System Data Acquisition Concentrators (SDACs),
- Audio Management Unit (AMU),
- cockpit handset,
- service interphone boomsets,
- calls panel,
- signs panel,
- Engine Interface Unit (EIU),
- Landing Gear Control and Interface Units (LGCIUs),
- Slat Flap Control Computers (SFCCs),
- Flight Warning Computers (FWCs),
- service interphone override P/BSW,
- Flight Attendant Panel (FAP),
- other DIR,
- cockpit door switch,
- EVACuation panel,
- EVAC horn,
- PRerecorded Announcement and Music (PRAM) audio reproducer (optional),
- Decoder/Encoder Units (DEUs) B,
- DEUs A,
- top line cut-off relay,
- pin programming,
- indicator light control box,
- exit signs relay,
- cargo smoke detectors,
- In-Flight Entertainment (IFE),
- Air Conditioning System Controllers (ACSCs),
- Cabin Pressure Controllers (CPCs),
- motor start relay vacuum generator.

NOTE: The Cabin Intercommunication Data System (CIDS) DIRs 1 and 2 have the same interfaces and the same computations. The outputs of the director in stand-by mode are disabled, except the BITE test which can be carried out by the CFDIU.

CFDIU

Low speed ARINC 429 data buses are used for BITE data transmission to the CFDIU.

SDAC

High speed ARINC 429 data buses are used for transmission of doors position information from SDAC 1. This information is used by the DIR to activate the seat row numbering lights during boarding and for display purposes on FAP. 5 discrete signals are sent to the SDACs for CIDS operation status information:
- No Smoking (NS) (or optionally EXIT) signs,
- Fasten Seat Belt (FSB) signs,
- portable electronic device signs,
- CIDS operation status,
- CIDS caution.

AMU

Audio and discrete lines are used for transmission or reception of the Passenger Address (PA) announcements or interphone communications. Discrete lines are used for activation or deactivation of the PA, interphone, attendant call and attendant call reset functions.

COCKPIT HANDSET

A cockpit handset is connected to the DIRs for PA announcements to the cabin.

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CALLS PANEL

Discrete lines are used for activation of calls to the cabin attendants or to the ground mechanics with dedicated visual and aural indications.

SIGNS PANEL

Discrete lines are used for manually or automatically activate or deactivate the info signs in the cabin.

EIU

A discrete signal is used to automatically increase audio level in the cabin when engine is running.

LGCIU

Two discrete lines are used for incrementation of the fault memory or activation or deactivation of the service interphone and NS/FSB signs when the info switches are in the auto position.

NOTE: Note: The AUTO position on the SEAT BELTs switch is available as an option.

SFCC

Discrete signals are used for automatically activate or deactivate the NS/FSB info signs in the cabin.

NOTE: Note: The AUTO position on the SEAT BELTs switch is available as an option.

FWC

An ARINC 429 bus gives from the CIDS Smoke Detection Function (SDF) information to the FWCs in order to give indications on the ECAM upper display unit. A discrete line is used for activation of aural warnings in the cockpit, through the FWC.

SERVICE INTERPHONE OVERRIDE P/BSW

A discrete line is used to activate or deactivate the service interphone system when the aircraft is in flight or on the ground with the landing gear not compressed and the external power plug not connected.

FAP

Ethernet buses are used to control and monitor different cabin system and the CIDS, and to indicate system status. The FAP can also be used to access the Centralized Fault Display System (CFDS) reports. Discrete line is used for reset.

DIRECTORS

Low speed ARINC 429 data buses are used for data exchange between the active and standby directors. The discrete lines are used for the synchronization of the two DIRs.

COCKPIT DOOR SWITCH

The cockpit door switch discrete signal is used to automatically dim the lights and attenuate the PA announcement level, at the entrance door, when the engines are running and the cockpit door is open to avoid acoustic feedback with the cockpit.

EVAC PANEL

Discrete lines are used to activate or deactivate aural and visual indications in the cockpit and cabin after activation of the EVAC system.

EVAC HORN

An analog signal activates the EVAC aural signal.

PRAM

Audio and discrete lines are used for the broadcasting of prerecorded messages and BoardinG Music (BGM) programs. The low speed ARINC 429 data buses are used for transmission of the BITE and status system.

NOTE: The PRAM can optionally be an audio cassette/Compact Disc audio reproducer type.

DEU B

Two bi-directional middle data bus lines are used for the transmission of the controls, audio data, BITE and status system information of the cabin crew systems.

DEU A

Two bi-directional top data bus lines are used for the transmission of the controls, audio data, BITE and status information of the various passenger cabin systems.

TOP LINE CUT-OFF RELAY

The top line cut-off relay discrete signal is used to activate or deactivate the top line cut-off relays when the emergency mode is activated, in order to cut the supply of the type A DEUs and decrease the power consumption.

PIN PROGRAMMING

Discrete signal is used to determine the active or standby director.

INDICATOR LIGHT CONTROL BOX

Discrete lines are used for activation, deactivation, test or dimming of the EMERgency CALL, SerViCE INTerPHone and PA indication light, from the ANNunciator LighT P/BSW via the indicator light control box.

EXIT SIGNS RELAY

A discrete line is used for activation or deactivation of the EXIT signs when the NS signal, from the signs panel, or the SIGNS ON signals, from the Cabin Pressure Controller (CPC), are activated or deactivated.

CARGO SMOKE DETECTORS

The cargo smoke system is linked by Controller Area Network (CAN) buses, for the cargo compartment smoke detection indication.

IFE (OPTIONAL)

Arinc 429, audio and discrete lines are used for music and video distribution for the passengers.

ACSC

Arinc 429 data buses lets individual control of FWD and aft temperature zones of the aircraft through the FAP.

CPC

Discrete line is used for an automatic announcement and audio level increase (4 dB) in case of cabin depressurization. Analog line is used to transmit cabin pressure data for vacuum generator control.

MOTOR START RELAY VACUUM GENERATOR

Discrete line is linked to the motor starting relay to activate the vacuum generator according to the altitude.

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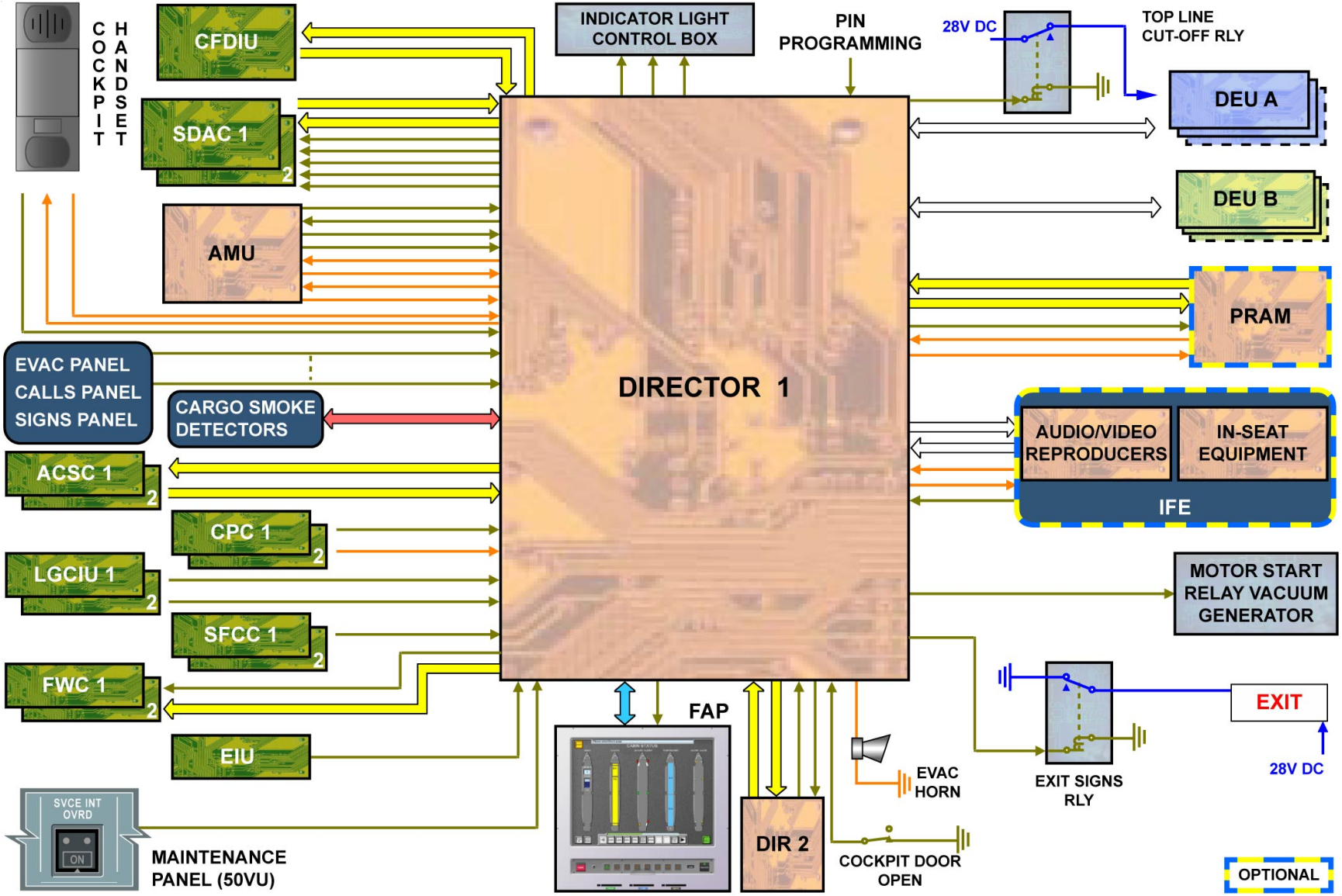

GENERAL ... MOTOR START RELAY VACUUM GENERATOR

FAP & AAP INTERFACES (3)

FAP INTERFACES

The Flight Attendant Panel (FAP) is connected to the directors (DIRs) through ethernet data buses to control and monitor different cabin systems and the Cabin Intercommunication Data System (CIDS). The FAP receives discrete signals from DIRs for FAP reset. To activate emergency lights, the FAP is also connected to the emergency lighting system via discrete signals.

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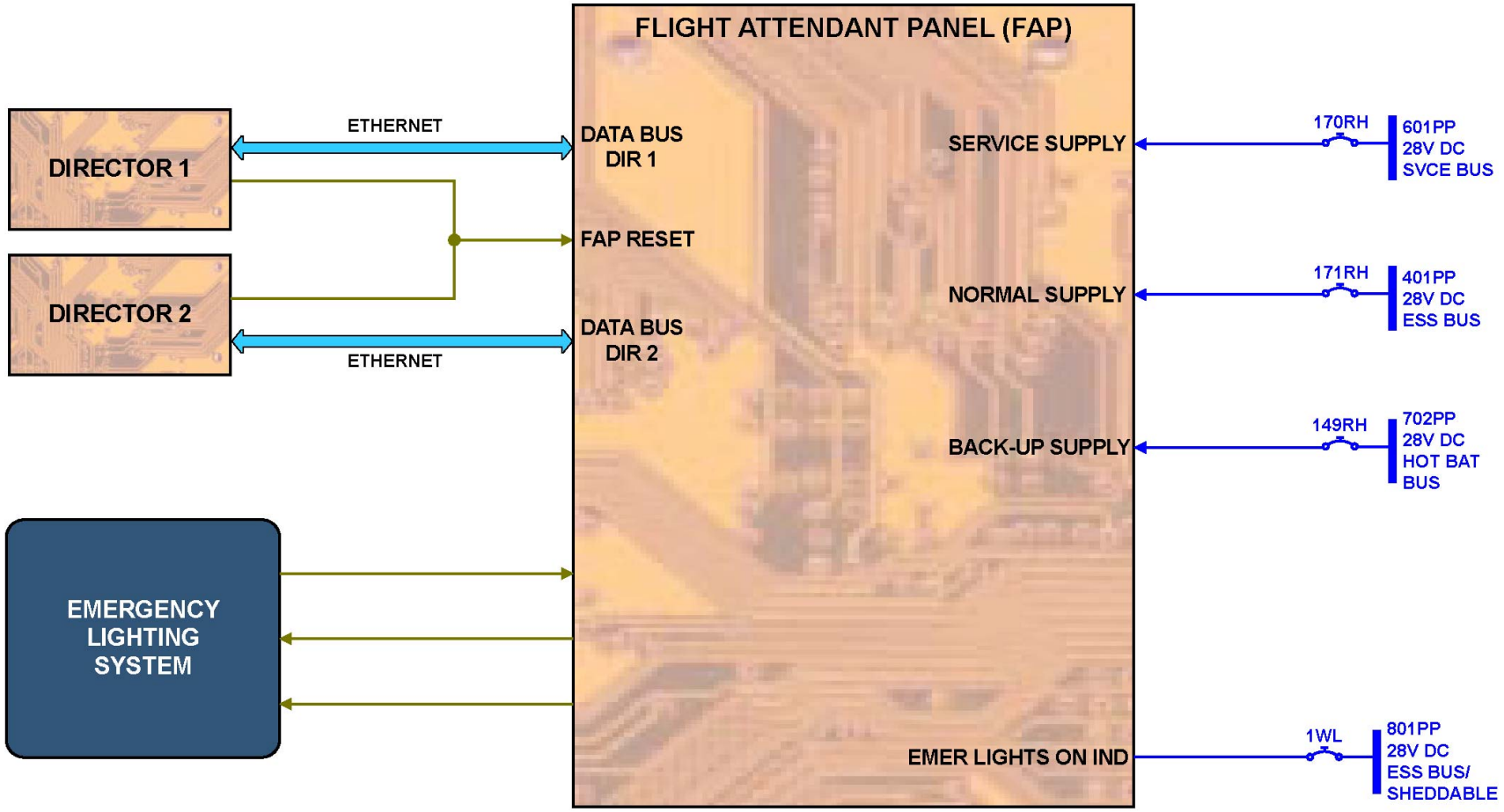

FAP INTERFACES

FAP & AAP INTERFACES (3)

AAP INTERFACE

The Additional Attendant Panel (AAP) processing module is connected to the relevant type B Decoder/Encoder Unit (DEU), through RS 232 data buses, to let the attendants to control certain cabin system. The AAP receives 28V DC power supply from the relevant type B DEU. The AAP is connected to the relevant type B DEU for:
- activation of the EVACuation system signaling, reset and indication,
- local Light control/adjustment,
- SMOKE RESET command and indication (optional),
- CALL RESET (optional).

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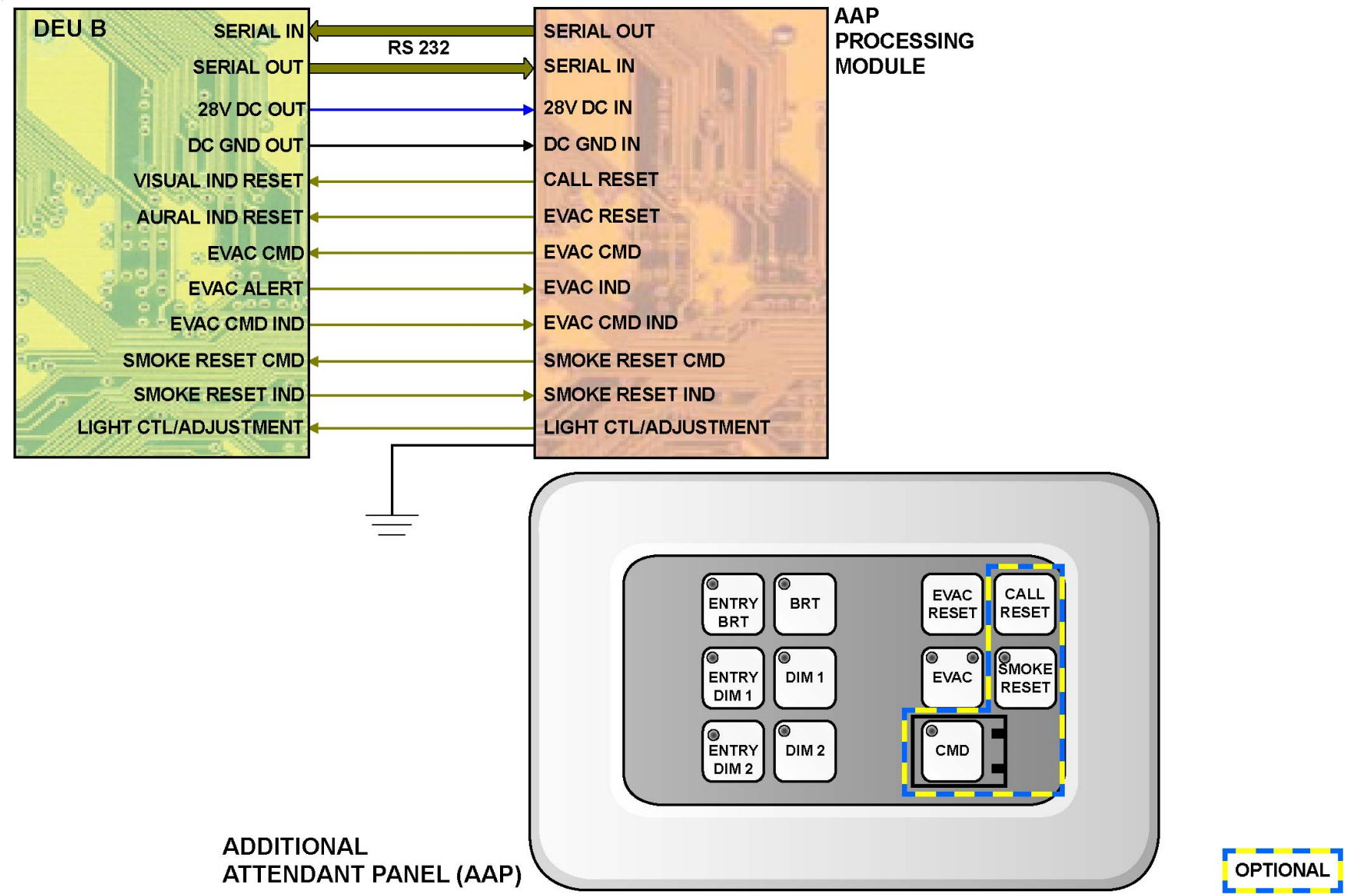


AAP INTERFACE

CIDS PROGRAMMING (3)

GENERAL

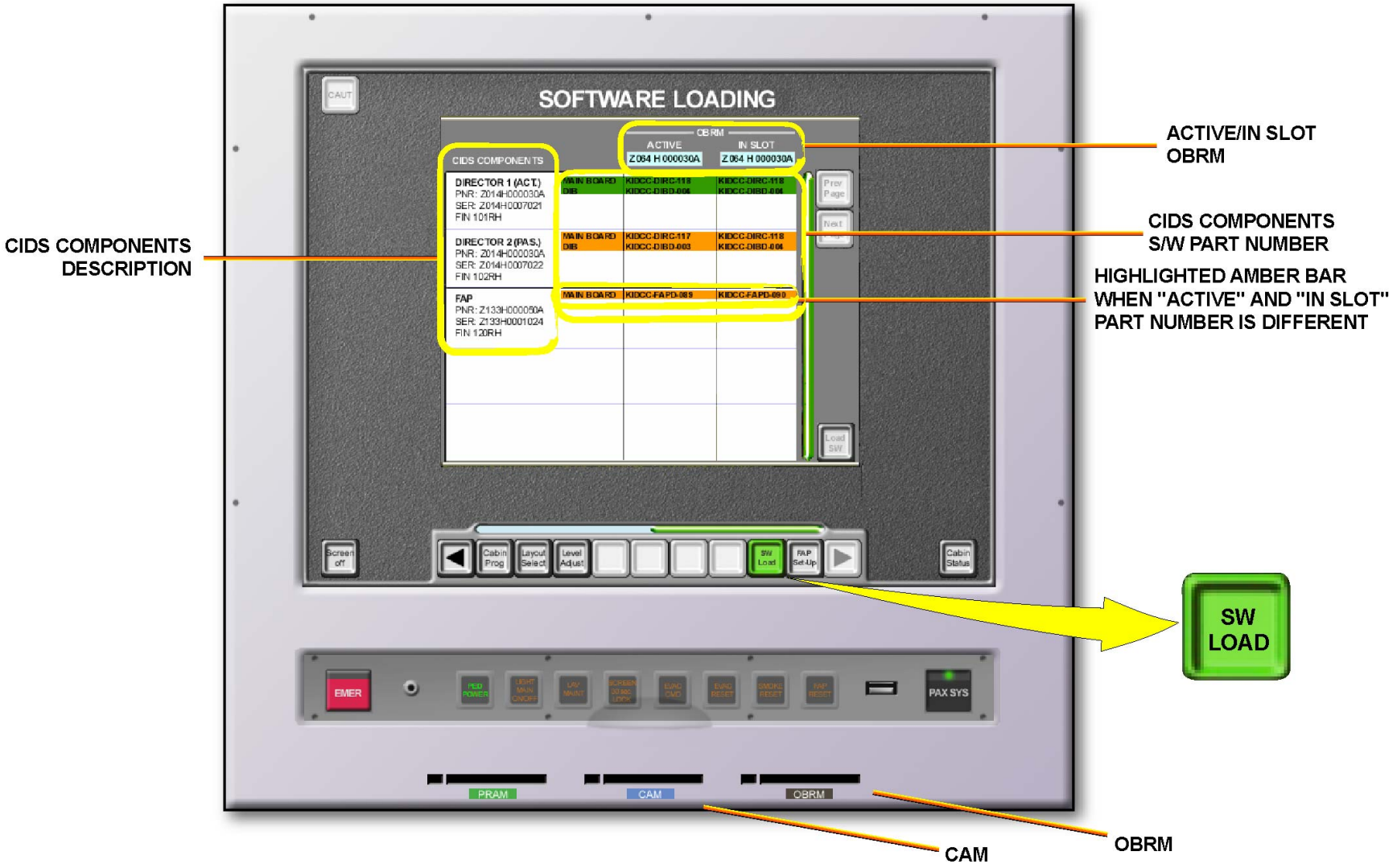
The cabin programming is made from the Flight Attendant Panel (FAP). The Cabin Intercommunication Data System (CIDS) is customizable. A system reconfiguration for the installation of options, cabin reconfiguration or CIDS expansion is limited to software database changes: the On Board Replaceable Module (OBRM) and the Cabin Assignment Module (CAM). The OBRM defines the operating software of the CIDS, and all connections to the related systems and emergency functions. The CAM defines the cabin layout. According to the program, the directors (DIRs) will consider the various cabin features and options validated by the CAM software and will make sure that the CIDS operates properly. This software is in the CAM A part. The CAM also has another essential role: To define all messages and page layouts of the FAP screen. It is known as CAM B. During the CIDS power-up, the DIRs will compare CAM and OBRM layout with their memories. If they find a difference, CAM data will be downloaded automatically. OBRM data can be downloaded manually by the FAP SOFTWARE LOADING page only. In the case of a total FAP failure combined with loss of the CAM and the OBRM flash cards, the CIDS will operate in restricted operating mode (basic functions active), thanks to the simplified operating software and cabin layout memory stored in the DIRs. The CIDS programming can operate on:
- SOFTWARE LOADING,
- CABIN PROGRAMMING,
- LAYOUT SELECTION,
- LEVEL ADJUSTMENT.

NOTE: Note: The FAP pages are protected from unauthorized use by a password except for the FAP SET-UP page.

SOFTWARE LOADING

To load the CIDS software, the SOFTWARE LOADING page on the FAP should be used (SW Load button). This page is protected by an access code and is only available on ground. Plug in new data storage hardware (OBRM flash card) to load the new software version. The FAP "SOFTWARE LOADING" page will show the CIDS hardware and software details as follows:
- DIRs and FAP Part Numbers (PN), Serial Numbers (SN) and Functional Item Number (FIN),
- active OBRM PN and software PN,
- in slot OBRM PN and software PN.

NOTE: Note: When the 'active' and 'in slot' data is different, it is highlighted in amber. If there is no difference, it is highlighted in green.



FLIGHT ATTENDANT PANEL (FAP)

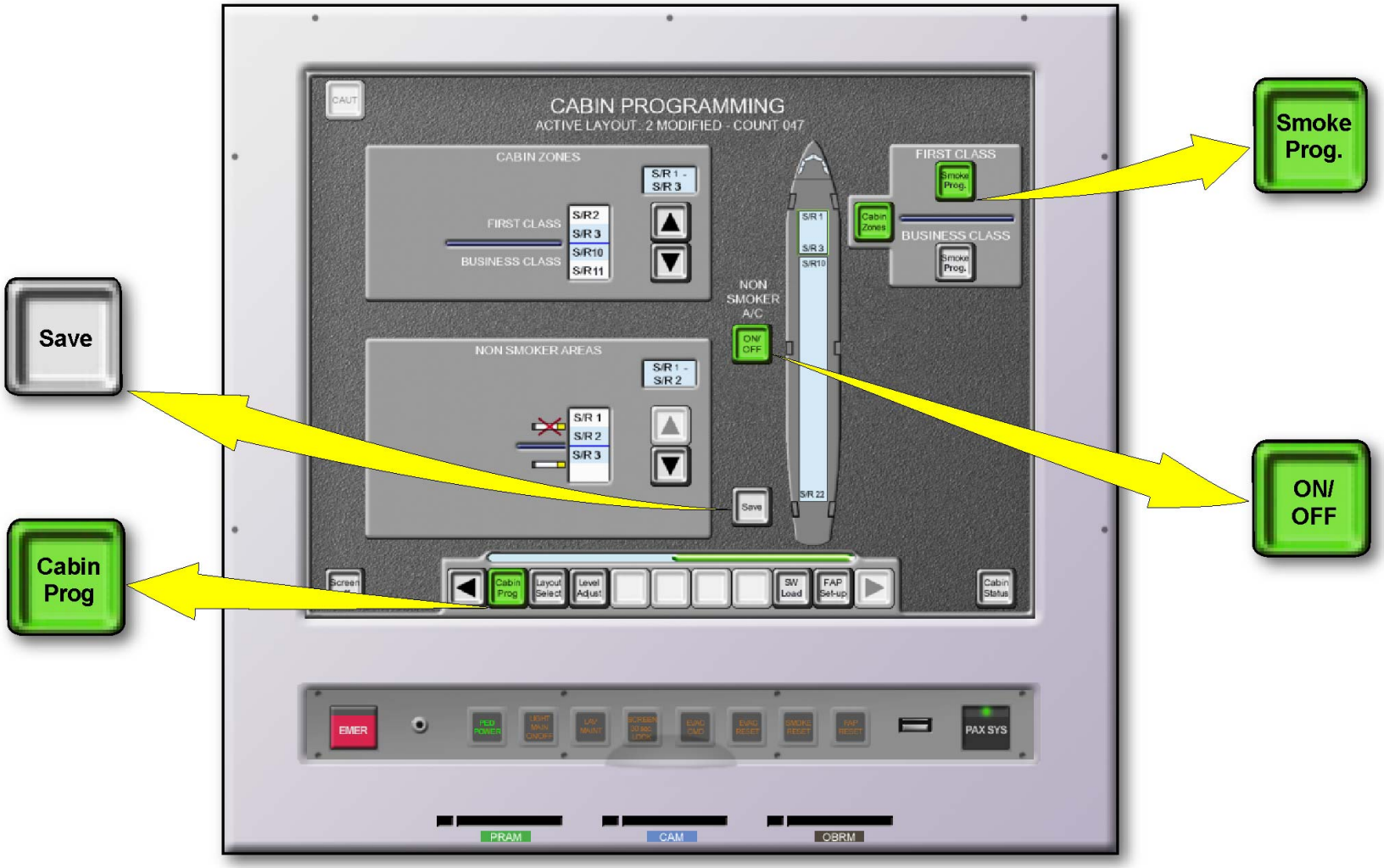
GENERAL & SOFTWARE LOADING

CIDS PROGRAMMING (3)

CABIN PROGRAMMING

The CIDS makes the cabin zone boundaries and the no smoking zone boundaries changes. This programming function is possible on ground and in flight. To relocate these zone boundaries, select the Cabin Prog button and the area Smoke Prog buttons on the FAP CABIN PROGRAMMING page. Zone boundaries are situated between two seat rows. Each cabin zone has to contain a minimum of one seat row. The NON SMOKER A/C ON/OFF button is used to set the entire cabin as a no smoking area. Thus the Smoke Prog buttons are disabled. To save the changes, push the Save button. The change is saved in the CAM as a modified layout. Without saving the new entries, the previous settings stay valid.

NOTE: The option "Non Smoker aircraft at first power up" is standardized. The aircraft acts as a "Non-Smoker Aircraft" from the first flight on without any manual reprogramming. In this case all NS signs will be on at every power up. The non-smoker aircraft at power up will be set in the CAM as a default setting.



FLIGHT ATTENDANT PANEL (FAP)

CABIN PROGRAMMING

CIDS PROGRAMMING (3)

LAYOUT SELECTION

The CAM can contain up to three pre-programmed cabin layouts and 3 additional modified layouts. These layouts are selectable on the FAP LAYOUT SELECTION page, which is available on ground and in flight, and protected by an access code. Each time new settings are saved, a modified layout is created under the basic layout used before modifications. If new settings are applied to a modified layout, saving the new layout parameters will increment the modified layout count number. The selected layout is highlighted by a colored bar. Use the UP/DOWN buttons to select a layout and the Load button to activate it.

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FLIGHT ATTENDANT PANEL (FAP)

LAYOUT SELECTION

CIDS PROGRAMMING (3)

LEVEL ADJUSTMENT

The CIDS is used for the adjustment of volume of chimes and announcements changes in all defined cabin areas independently. To change the settings in one area, the FAP LEVEL ADJUSTMENT page has to be selected via the Level Adjust button. Then select CABIN ZONES, ATTENDANT AREAS or LAVATORY Adjust button. Push the UP/DOWN buttons on the VOLUME ADJUSTMENT subpanel to select the area (e.g. FIRST CLASS) and then push the +/- buttons to adjust the volume. The adjustment goes from -6 to +6 dB related to the nominal volume. The Default button resets all modifications to the CAM default values. To save the changes, push the Save button. Without saving the new entries, the previous settings stay valid.

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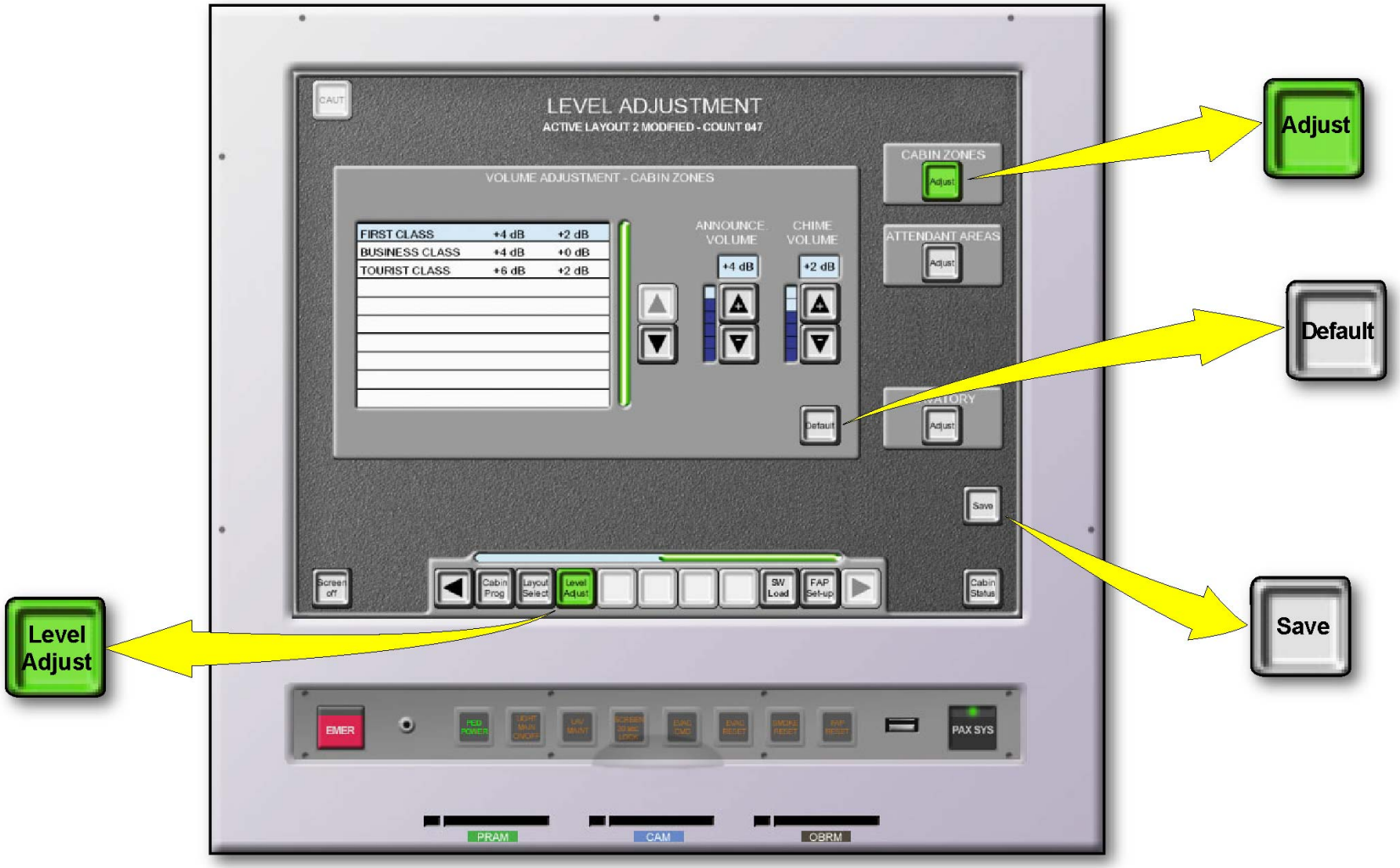

FLIGHT ATTENDANT PANEL (FAP)

LEVEL ADJUSTMENT

CIDS PROGRAMMING (3)

FAP SET-UP

The CIDS enables the brightness of the screen to be changed and to adjust the volume settings for the FAP internal loudspeaker and headphone. To change the settings, the FAP SET-UP page has to be selected via the FAP Set-up button. The TOUCHSCREEN CLICK ON/OFF button makes the FAP emit a key click through the internal loudspeaker each time a button is selected. It becomes green when selected. Push the related +/- buttons to adjust the display brightness and the internal loudspeaker or headphone volume. The Default button resets all the FAP SET-UP modifications to the CAM default values. To save the changes, push the Save button. Without saving the new entries, the previous settings stay valid. Before removal or installation of one of the compact flash cards iPRAM, CAM, OBRM, the required slot must be deactivated by a "Remove" touch-key.

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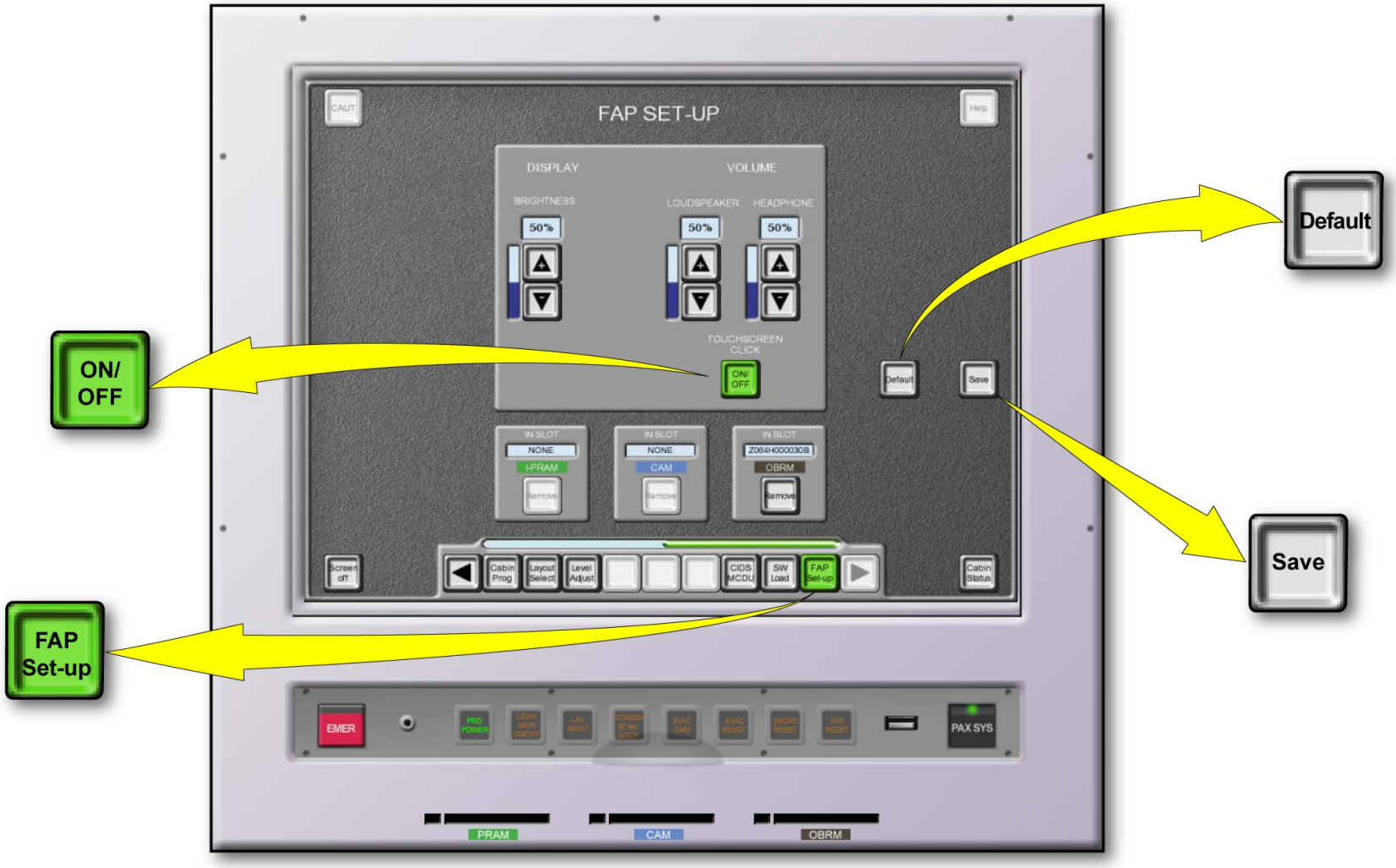


FLIGHT ATTENDANT PANEL (FAP)

FAP SET-UP

PASSENGER ENTERTAINMENT SYSTEM PRESENTATION (PANASONIC) (2)

GENERAL

The Passenger Address (PA) and entertainment system comprises the following basic functions:
- Passenger Entertainment System (PES),
- PES video,
- PRerecorded Announcements and Music system (PRAM).

The PES comprises the PES music, the PA announcement and the passenger service.

PES

The PES transmits prerecorded music programs, PA information, video and video sounds to the passengers. The audio signals can be heard through headphones connected to the Passenger Control Units (PCUs). The PCU allows several music channels and video audio channels to be selected and the volume to be adjusted. The PCU also allows the reading lights and passenger calls to be remotely controlled through the Passenger Services System (PSS). All prerecorded announcements (video and sound) and the PA messages, heard in the headphones through the PCUs, have priority over the music and video sound entertainment channels. The PA announcements and messages are also broadcast through the loudspeakers and headsets, via the Cabin Intercommunication Data System (CIDS). The PES audio reproducers supply music channels to the MAIN MUltipleXer (MAIN MUX) and BoardinG Music (BGM) channels to the CIDS directors (DIRs). The CIDS broadcasts the BGM through the loudspeakers. BGM channel and volume control is performed on the Flight Attendant Panel (FAP). The MAIN MUX is connected to the CFDS via the CIDS DIRECTOR to ensure the PA BITE function.

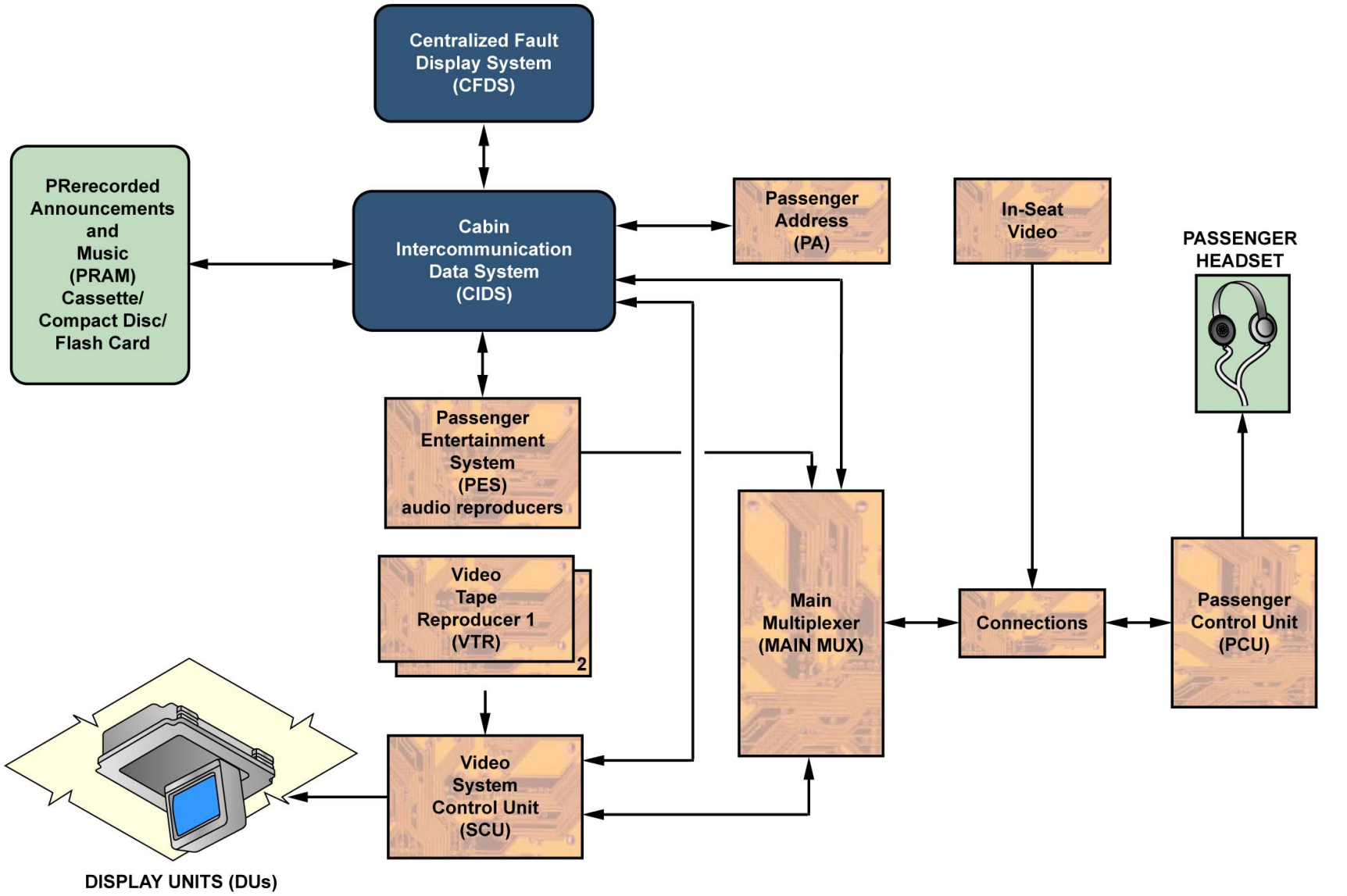
PES VIDEO

The PES video shows prerecorded movies and video announcements through different Display Units (DUs) in the passenger compartment. The video is transmitted to the video System Control Unit (SCU) from the Video Tape Reproducers (VTRs). The video sound is transmitted to the MAIN MUX and to the CIDS. Therefore video sounds can be heard from the headset through the PCU or from the loudspeakers. The in-seat video DUs are supplied through the MAIN MUX.

PRAM

The PRAM can be:
- an audio tape reproducer,
- a compact disc reproducer,
- a flash card directly plugged in the Flight Attendant Panel only.

Reproducers or flash card contain prerecorded announcements and BGM supplied to the CIDS DIRs. The announcements are also sent to the MAIN MUX. The PRAM is controlled from the FAP.


Centralized Fault Display System (CFDS)
PRerecorded Announcements and Music (PRAM) Cassette/ Compact Disc/ Flash Card
Cabin Intercommunication Data System (CIDS)
Passenger Address (PA)
In-Seat Video
PASSENGER HEADSET
Passenger Entertainment System (PES) audio reproducers
Video Tape Reproducer 1 (VTR)
2
Main Multiplexer (MAIN MUX)
Connections
Passenger Control Unit (PCU)
Video System Control Unit (SCU)
DISPLAY UNITS (DUs)

GENERAL ... PRAM

PASSENGER ENTERTAINMENT SYSTEM PRESENTATION (PANASONIC) (2)

COMPONENT LOCATION

The PES is composed of the audio reproducer, the Digital Interface Unit (DIU) and the main multiplexer. These computers are located in the Avionics rack 80 VU.

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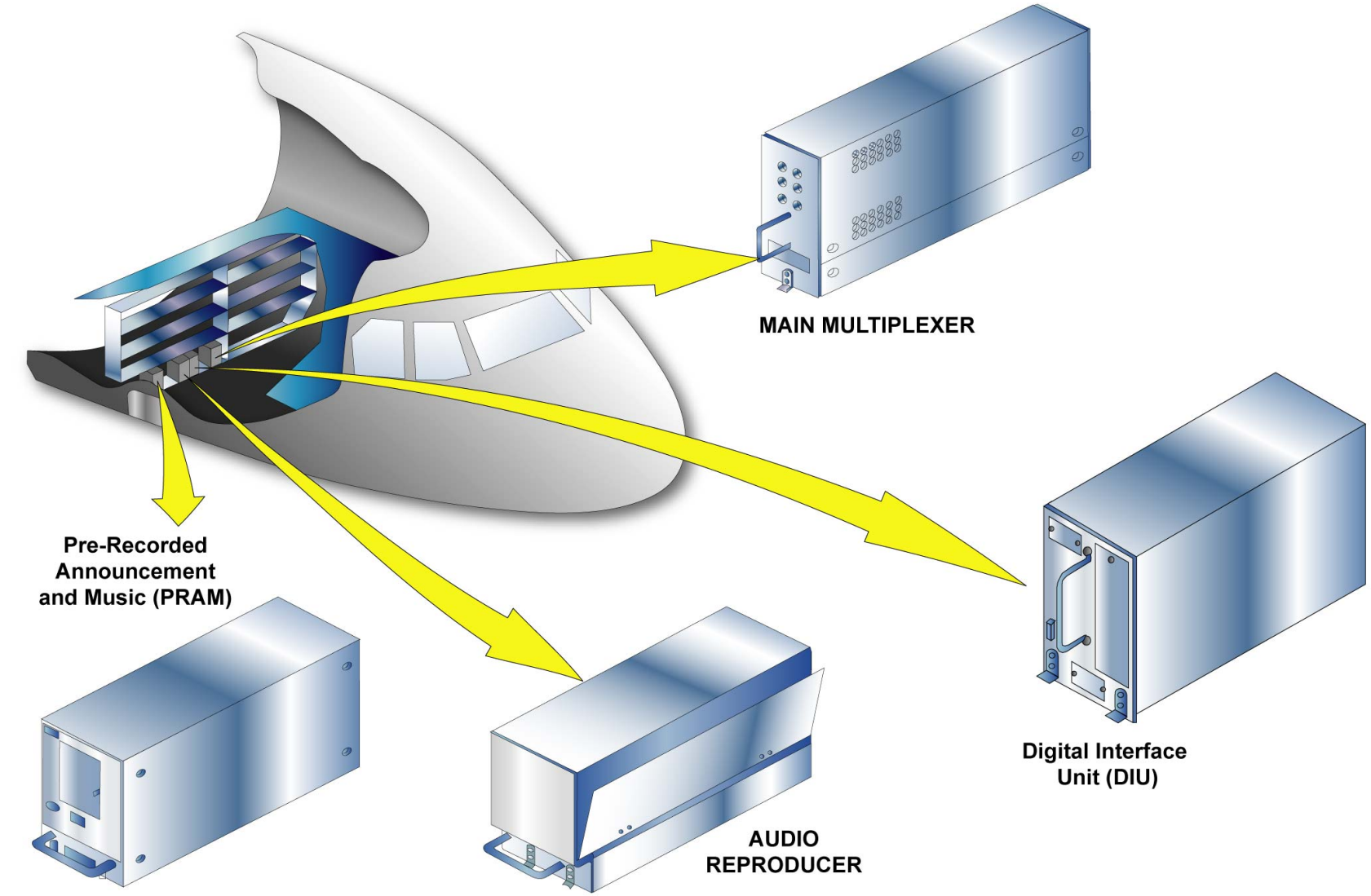

COMPONENT LOCATION

PASSENGER ENTERTAINMENT SYSTEM PRESENTATION (THALES) (2)

GENERAL

The In Flight Entertainment (IFE) system comprises the following basic functions:
- Passenger Address (PA) through the Cabin Intercommunication Data System (CIDS),
- Interactive utilities,
- Audio and Video On Demand (AVOD),
- PRerecorded Announcements and Music system (PRAM),
- BoardinG Music (BGM),
- Passenger Flight Information System (PFIS).

IFE

The IFE system transmits prerecorded music programs, video programs, PA information, to the passengers. The audio signals can be heard through headsets. The Passenger Control Units (PCUs) allows several music and video channels to be selected and the volume to be adjusted. The PCU also allows the reading lights and passenger calls to be remotely controlled through the Passenger Services System (PSS). All prerecorded announcements (video and sound) and the PA messages, heard in the headsets, have priority over the music and video sound entertainment channels. The PA announcements and messages are also broadcast through the cabin loudspeakers, via the CIDS. The Audio/Video Controller (AVC) supplies the BGM channels to the CIDS directors (DIRs). The CIDS broadcasts the BGM through the loudspeakers. BGM channel and volume control is done on the Flight Attendant Panel (FAP). The PA operational functionalities are done via the CIDS through the cockpit and the cabin handsets.

AVOD

The AVOD shows video movies and video announcements through different Display Units (DUs) in the cabin via various video sources (Video Tape Reproducers (VTRs), DVD players and servers).
Interactive functions are also available from the passenger seats (games, duty free,...).
Audio, video, announcements are managed from the Cabin Management Terminal (CMT) in the Video Control Center (VCC).

PRAM

The PRAM can be:
- an audio tape reproducer,
- a compact disc reproducer,
- a flash card directly plugged in the FAP.

Reproducers or flash card contain prerecorded announcements and BGM supplied to the CIDS DIRs. The PRAM is controlled from the FAP.

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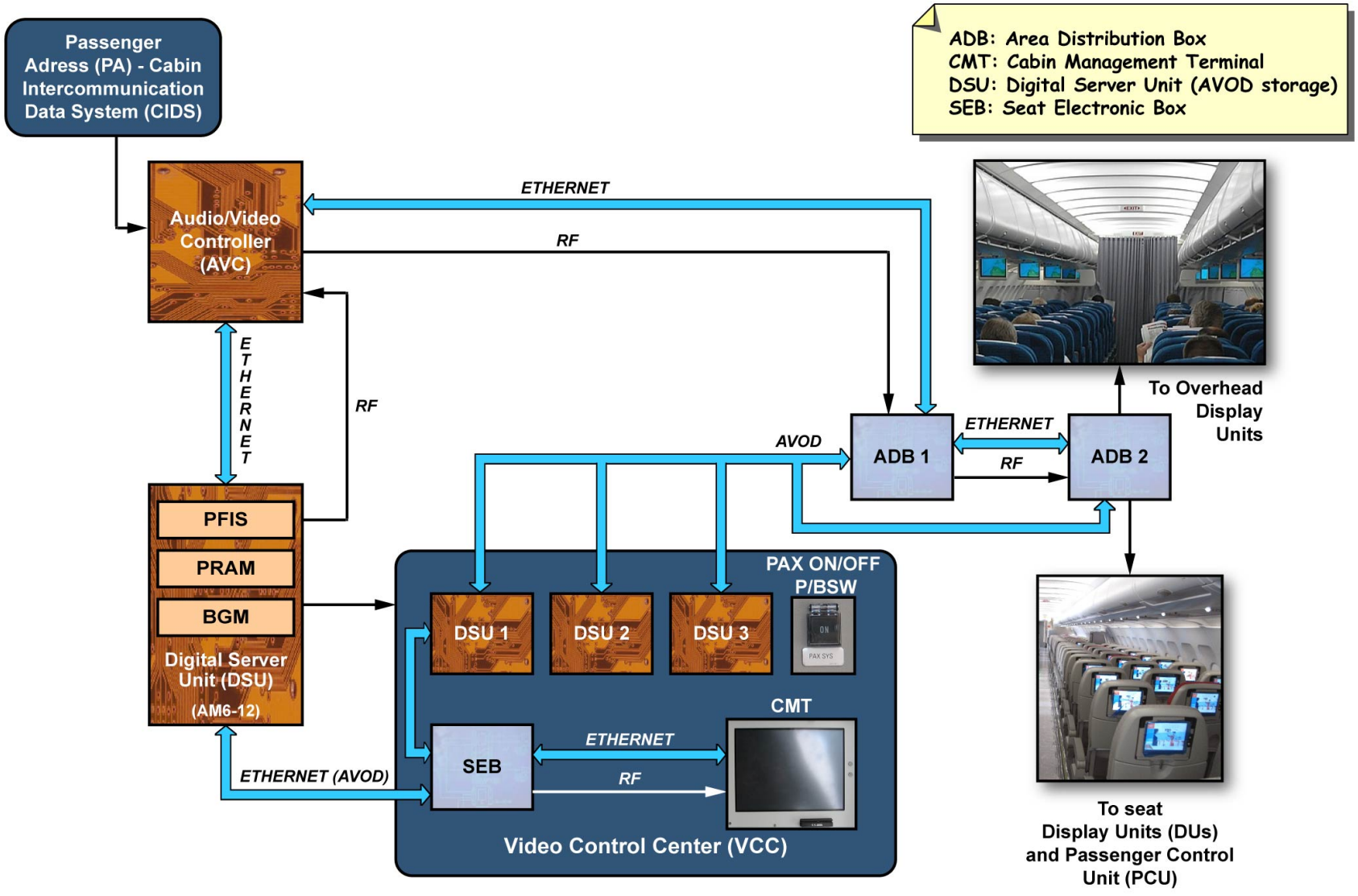

GENERAL ... PRAM

PASSENGER ENTERTAINMENT SYSTEM PRESENTATION (THALES) (2)

COMPONENT LOCATION

The PES - THALES Line Replaceable Units (LRUs) are located in the VCC (Cabin) and the In Flight Entertainment Center (IFEC) located in 80VU.
The VCC gives the central control point for the system. The VCC is also fitted with plugs and USB ports, DVD player and Data Media Storage.

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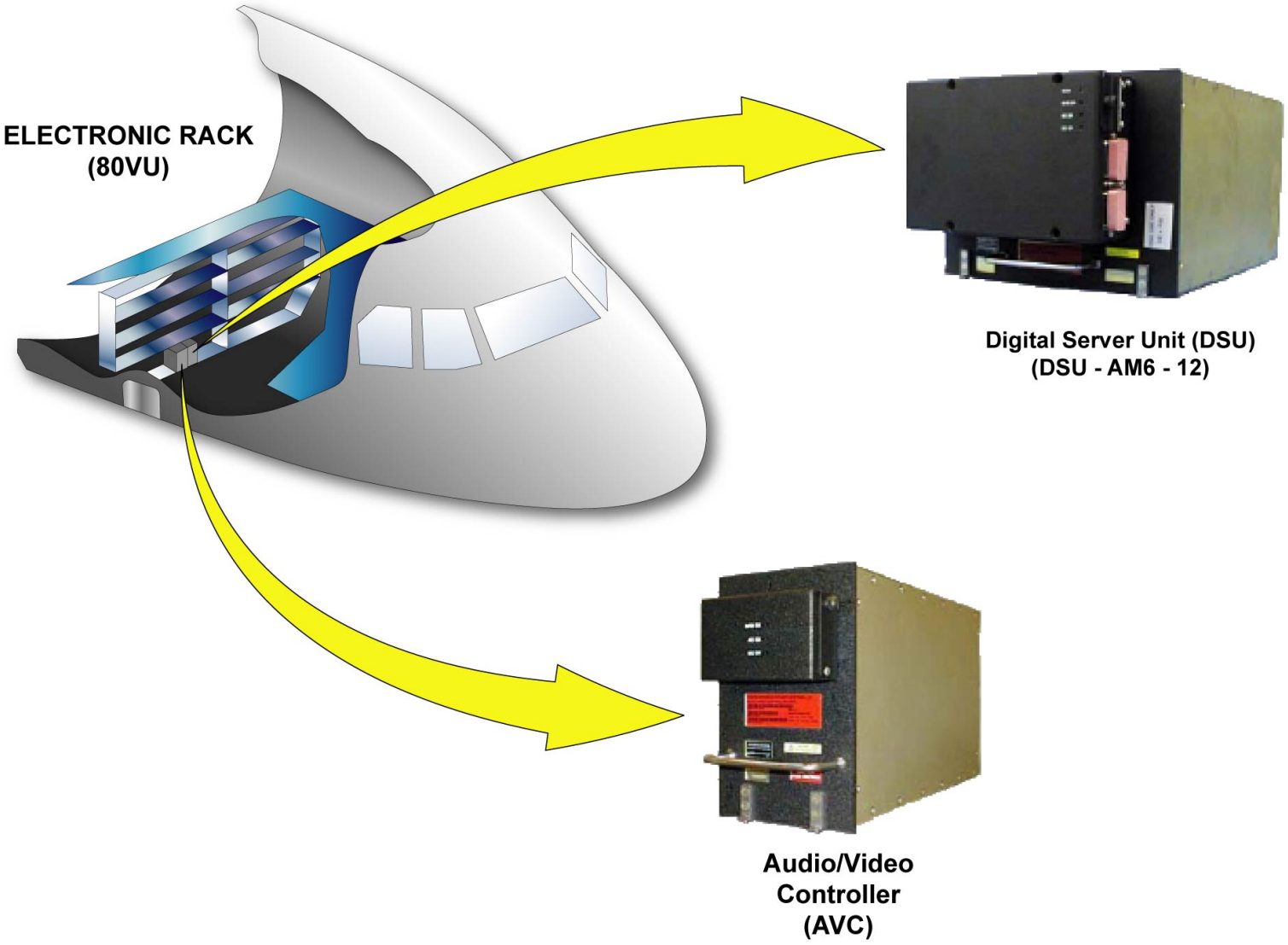
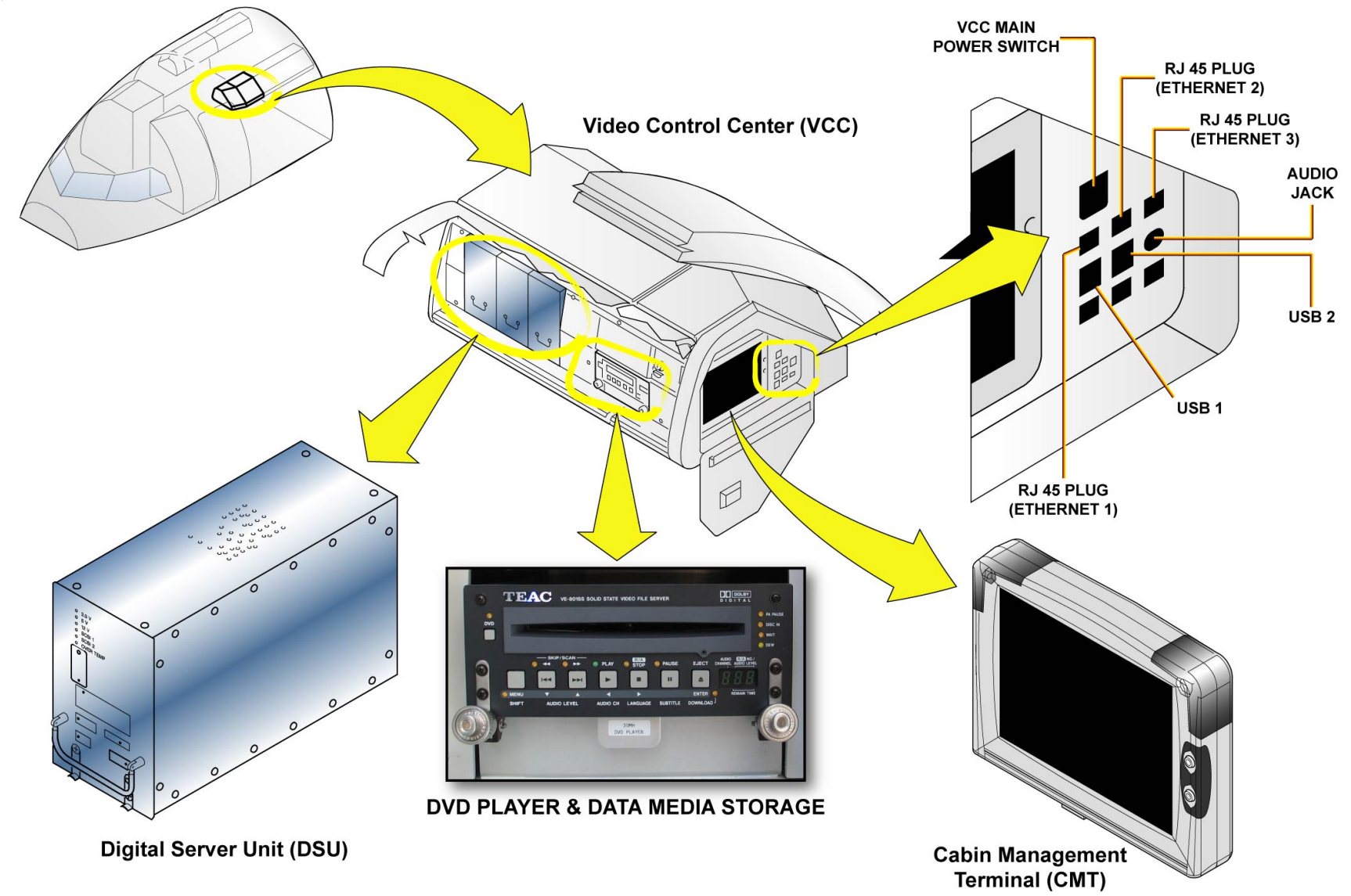


COMPONENT LOCATION



COMPONENT LOCATION

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PASSENGER MUSIC ENTERTAINMENT SYSTEM D/O (PANASONIC) (3)

MAIN MULTIPLEXER

The MAIN MUltipleXer generates a Radio Frequency (RF) signal which contains the audio information from the audio reproducer(s), and video System Control Unit (SCU), Passenger Address (PA) announcements from the Cabin Intercommunication Data System (CIDS) and video signals from the video SCU. If PA announcements are to be made, the CIDS sends a keyline signal to the audio reproducer and to the Video Tape Reproducers (VTRs) , through video SCU, to stop them. A coaxial cable transmits the RF signal to the Seat Electronic Boxes (SEBs), according to the zone selection through the Wall Disconnect Boxes (WDBs). The SEBs only transmit the selected audio signal to the headsets through the Passenger Control Unit (PCU). A zone selection, for PA announcements and video sounds, for a maximum of 2 zones, is made through keylines. Passenger Services System (PSS) digital data is exchanged between the MAIN MUX and the PCU. The MAIN MUX transmits this data through an ARINC 429 data bus to the CIDS directors (DIRs).

WDB

Each WDB supplies a maximum of 2 SEB columns.

SEB

The SEB changes the combined RF audio signal back to its original analog form and only transmits the selected program to the PCU. Each SEB supplies a maximum of 3 PCUs. The SEBs receive PCU selected data and transmit it to the CIDS DIR, through the WDB and the MAIN MUX.

PCU

The PCU allows the passengers to select the channel, to adjust the volume and to hear music and video sounds. Each PCU has a stereophonic transducer to drive a stereo pneumatical headset, or a jack for an electrical headset, or both.

AUDIO REPRODUCER

The audio reproducers provide different music programs from cassettes tape or compact disks, to the MAIN MUX. The audio reproducers also send one music program, among 4 music programs, for BoardinG Music (BGM), to the CIDS DIRs. The BGM program selection is done through 3 keylines from the CIDS DIR. BGM program selection and volume are controlled from the Flight Attendant Panel (FAP).

BITE

The BITE is used for detection and isolation of system and component faults. All BITE data of the Passenger Entertainment System (PES) music is assembled in the MAIN MUX. It transmits the BITE data through an ARINC 429 data bus via the CIDS directors to the Centralized Fault Display System (CFDS). The BITE data transmission to the CFDS is made continuously in normal mode and on request in interactive mode. In interactive mode, the BITE is connected to the MCDU through the CFDS. The MAIN MUX starts an automatic self-test after power-up and a manual self-test after transmission of the related MCDU commands.

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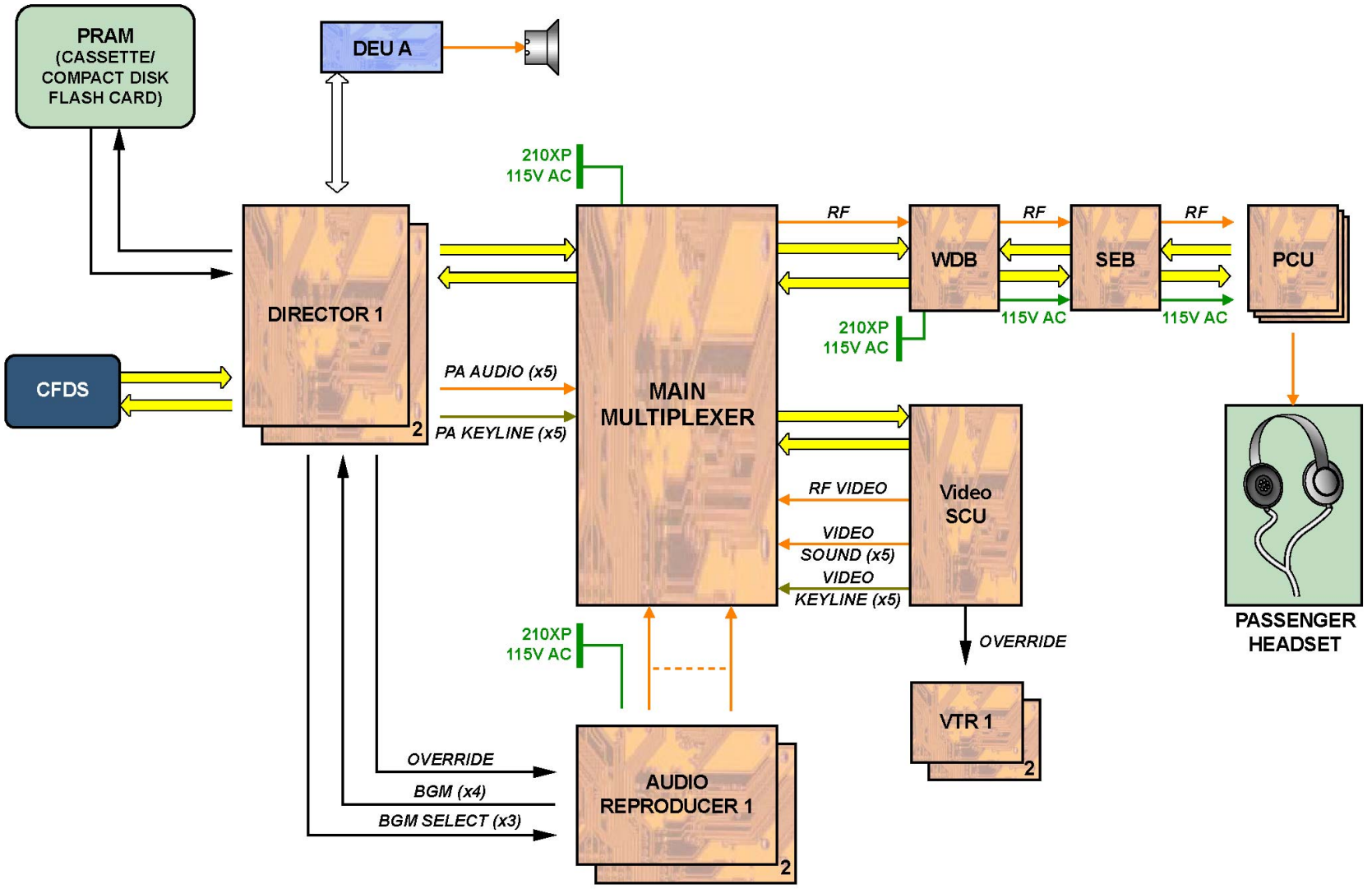


MAIN MULTIPLEXER ... BITE

VIDEO ENTERTAINMENT SYSTEM D/O (PANASONIC) (OPTION) (3)

VCC

The video System Control Unit (SCU) with the Video Tape Reproducers (VTRs) compose the Video Control Center (VCC). The video SCU controls the Passenger Entertainment System (PES) video. The video SCU receives video and audio signals from the VTRs. It generates a Radio Frequency (RF) signal which contains the video signals and sends it through the Tapping Units (TUs) to the related Display Units (DUs).
The video SCU operates in the following formats:
- PAL,
- SECAM,
- NTSC.

The video SCU sends the video sounds to the Main Multiplexer (MAIN MUX) and to the Cabin Intercommunication Data System (CIDS) directors (DIRs). The passengers can hear the video sounds through headsets connected to the Passenger Control Units (PCUs) or from the loudspeakers. Each Passenger Address (PA) announcement overrides the PES video sounds in the related zones and stops the VTRs. In case of a rapid cabin decompression, the video SCU stops the video transmission and controls the retraction of the DUs installed in the hatrack. The interface between the optional Cabin and Passenger Management System (CPMS) and the video SCU allows the following functions:
- remote control of the video system, camera control unit and Passenger Visual Information System (PVIS),
- display of news and advertisements provided by the CPMS,
- preview of video programs.

The PVIS is an option that receives information which is processed, formatted and transmitted as video signals to the video SCU. It transmits this information to the DUs. Optional video cameras convert optical images into video signals compatible with the video system. This signal is sent to the video SCU and can be shown on the DUs. The cameras can be remotely controlled from the CPMS.

VTR

The VTR supplies audio and video signals to the video SCU. The VTRs are remotely controlled from the video SCU. On the front panel of the VTRs, all the operation controls are installed. The following video systems are possible:
- VHS,
- SVHS,
- BETA,
- VIDEO 8,
- high band video 8.

The following signal formats are possible:
- PAL,
- SECAM,
- NTSC.

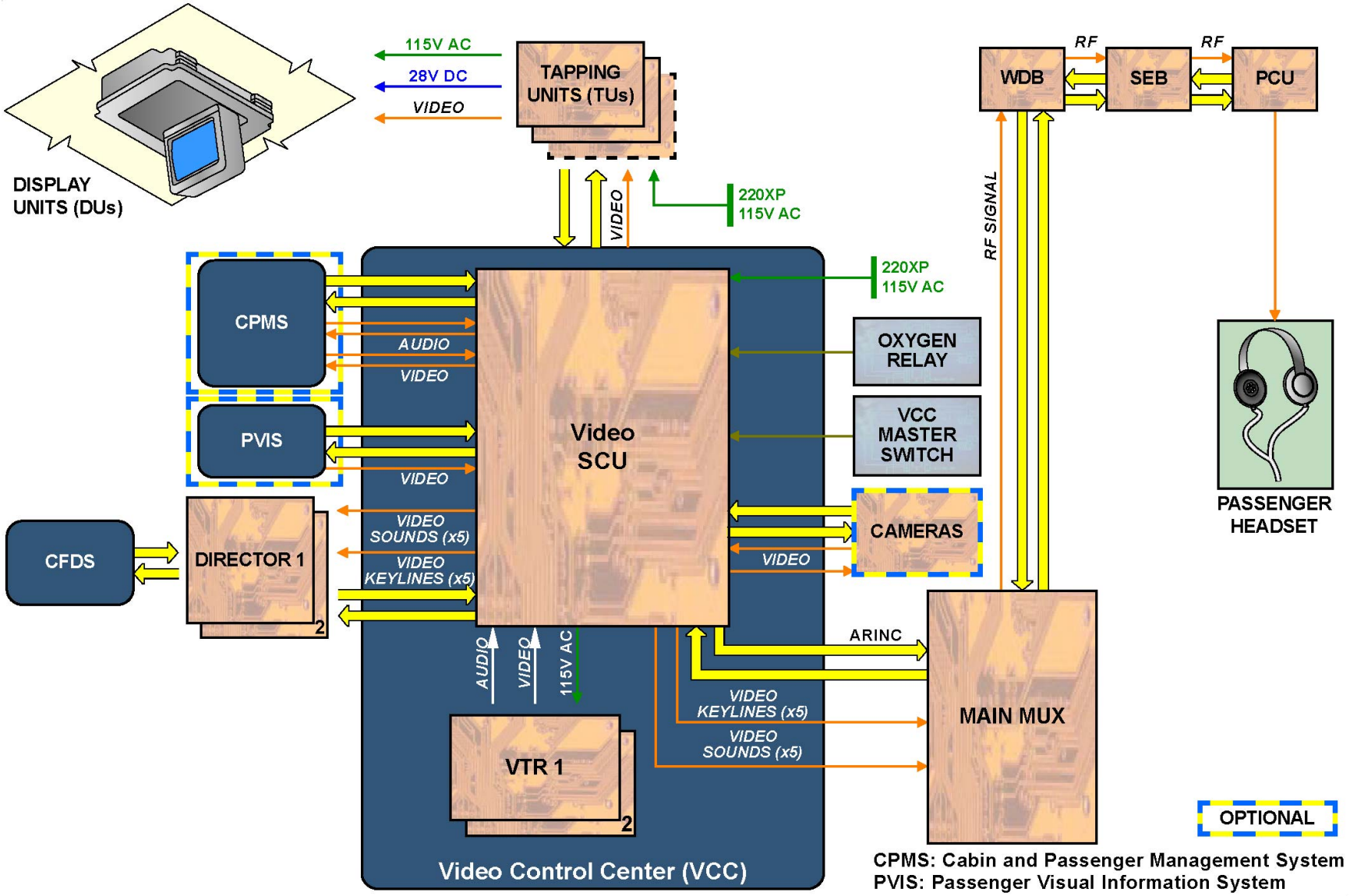
TAPPING UNIT

The TUs distribute the video signals to the DUs in each cabin zone. Each TU can supply a maximum of 2 displays. Each TU has a pin-coded address to give a unique address to the unit. This enables the video SCU to control each DU individually.

BITE

The BITE is assembled into the video system. All the PES video BITE data is transmitted through an ARINC 429 data bus to the MAIN MUX. The MAIN MUX sends this data through an ARINC 429 data bus via the CIDS DIRs to the Centralized Fault Display System (CFDS). The video SCU starts an automatic self-test after power-up and a manual self-test after transmission of the MCDU command. In CFDS interactive mode, the BITE is connected to the MCDU through the CFDS, to show the maintenance data, start a test or to show the Line Replaceable Unit

(LRU) identification. The BITE failure transmission to the CFDS is made continuously in normal mode, and on request in interactive mode.


DISPLAY UNITS (DUs)
115V AC
28V DC
VIDEO
TAPPING UNITS (TUs)
220XP 115V AC
VIDEO
WDB
RF
SEB
RF
PCU
RF SIGNAL
CPMS
PVIS
AUDIO
VIDEO
VIDEO
Video SCU
220XP 115V AC
OXYGEN RELAY
VCC MASTER SWITCH
CAMERAS
VIDEO
PASSENGER HEADSET
CFDS
DIRECTOR 1
2
VIDEO SOUNDS (x5)
VIDEO KEYLINES (x5)
ARINC
AUDIO
VIDEO
115V AC
VIDEO KEYLINES (x5)
VIDEO SOUNDS (x5)
MAIN MUX
VTR 1
2
OPTIONAL
Video Control Center (VCC)
CPMS: Cabin and Passenger Management System
PVIS: Passenger Visual Information System

VCC ... BITE

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VIDEO ENTERTAINMENT SYSTEM D/O (PANASONIC) (OPTION) (3)

DISPLAY UNITS

DUs are installed in the cabin. Each DU is connected to the nearest TU.
Each DU can operate with these formats:
- PAL,
- SECAM,
- NTSC.

A retraction/extension mechanism is used to move the overhead DUs, installed in the hatrack, into stowed or viewing position. Each DU is automatically energized in the viewing position, and de-energized in the stowed position. The DUs move automatically into the stowed position when:
- an electrical power loss occurs for more than 200 ms,
- a mechanical resistance occurs while the DU moves down,
- a rapid cabin decompression occurs,
- the VCC master switch is switched off.

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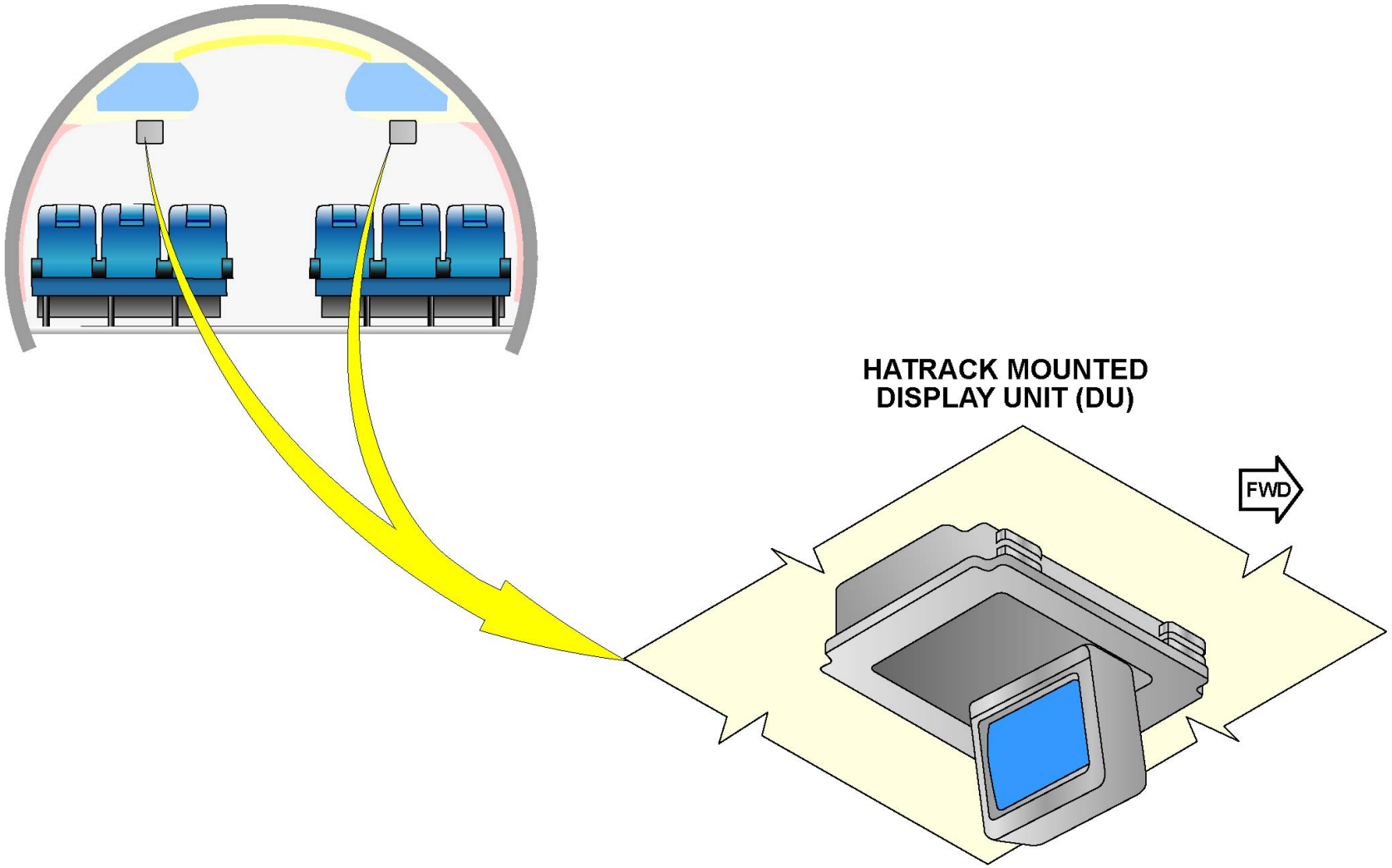

DISPLAY UNITS

IN-FLIGHT ENTERTAINMENT SYSTEM D/O (THALES) (OPTION) (3)

INTRODUCTION

The In-Flight Entertainment (IFE) system is an interactive, fully integrated passenger entertainment system. The IFE system offers the passengers the following services:
- "Classic" audio and video broadcast programs,
- safety and information announcements using the Passenger Address (PA) system,
- interactive utilities such as video games, internet features, and more,
- Audio and Video On Demand (AVOD),
- reading and attendant call lights control using the Passenger Service System (PSS),
- updated flight and destination information displays using the Passenger Flight Information System (PFIS),
- video images from the landscape cameras (Optional),
- telephone capability using the Passenger Air-to-ground Telephone System (PATS).

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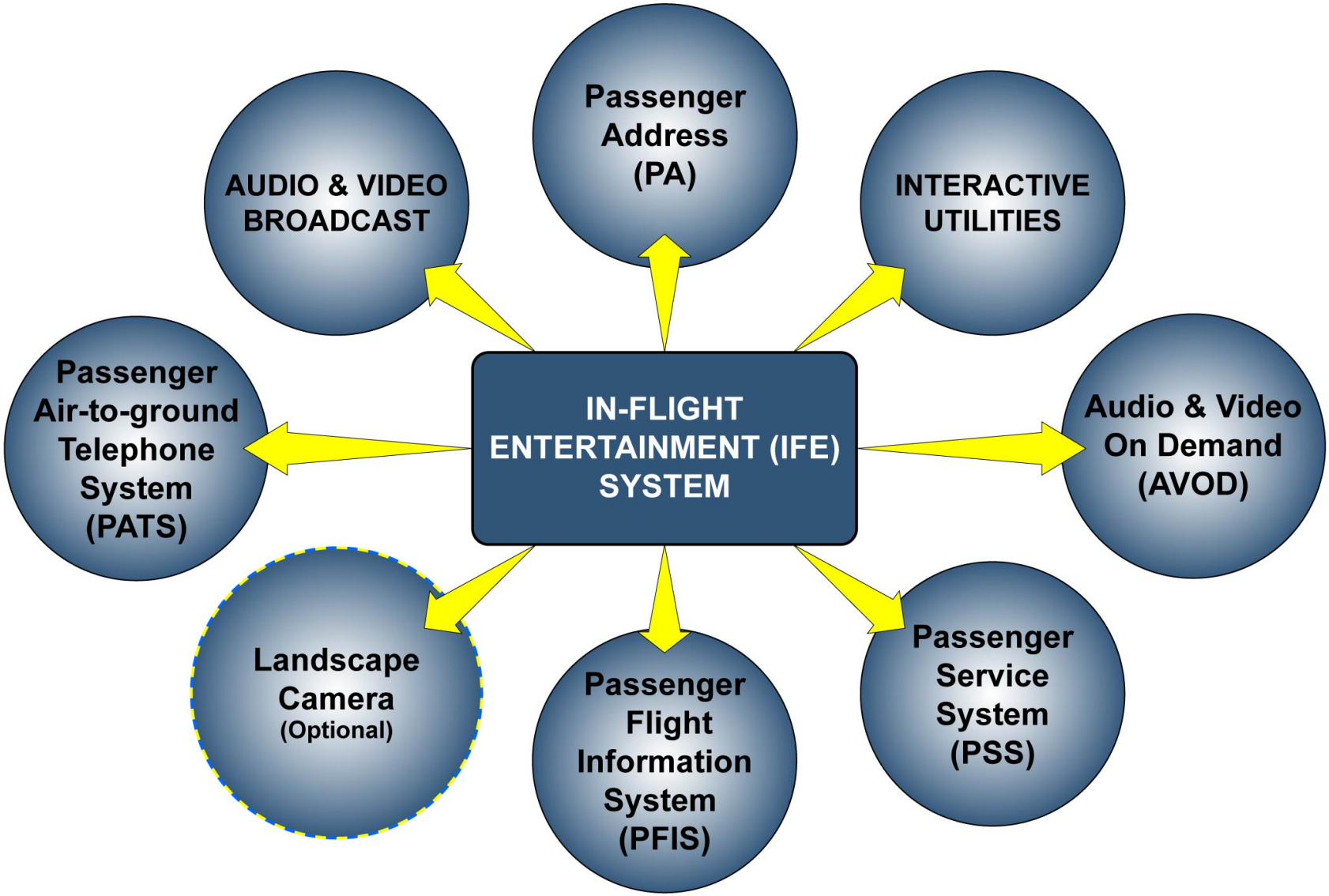
Passenger Address (PA)
AUDIO & VIDEO BROADCAST
INTERACTIVE UTILITIES
Passenger Air-to-ground Telephone System (PATS)
IN-FLIGHT ENTERTAINMENT (IFE) SYSTEM
Audio & Video On Demand (AVOD)
Landscape Camera (Optional)
Passenger Flight Information System (PFIS)
Passenger Service System (PSS)

INTRODUCTION

IN-FLIGHT ENTERTAINMENT SYSTEM D/O (THALES) (OPTION) (3)

SYSTEM ARCHITECTURE

The IFE system architecture covers the following three main areas:
- the In-Flight Entertainment Center (IFEC),
- the Video Control Center (VCC),
- the cabin related network.

The IFE system provides and routes audio/video signals from IFE center to each passenger seat.
The Audio/Video On Demand (AVOD) permits individual selection of programs displayed on individual video screens controlled by the Passenger Control Unit (PCU).
Pre-recorded Video Programs are also transmitted to overhead or wall mounted monitors from various video sources (VTR, DVD players, servers). The related sound is distributed to the passenger headsets and/or cabin loudspeakers that are part of the CIDS/PA system.
Interactive functions are also available from the passenger seat (games, duty free, passenger survey).
Passenger payment can be arranged by using credit card reader integrated in the seat.

IFE CENTER

The IFE center, installed in the avionics compartment (80VU), contains different type of equipments such as:
- system controller (Audio/Video Controller (AVC)),
- file server (Digital Server Unit (DSU AM6-12)).

The internal arrangement of the racks depends on the configuration selected by the operator.

VIDEO CONTROL CENTER (VCC)

The Video Control Center (VCC) contains the IFE system controls such as:
- IFE Cabin Management Terminal (CMT), (Touchscreen),
- audio/video sources (VTR, DVD Player),
- Digital Server Units (DSUs),
- credit card reader,
- keyboard,
- plugs/USB,
- VCC main power switch.

The RJ45 plug is used in Maintenance mode for software loading.
The USB port is used also in maintenance mode (small software) or entertainment mode for peripheral connection (Keyboard).
The smoke detection system is installed in the VCC.

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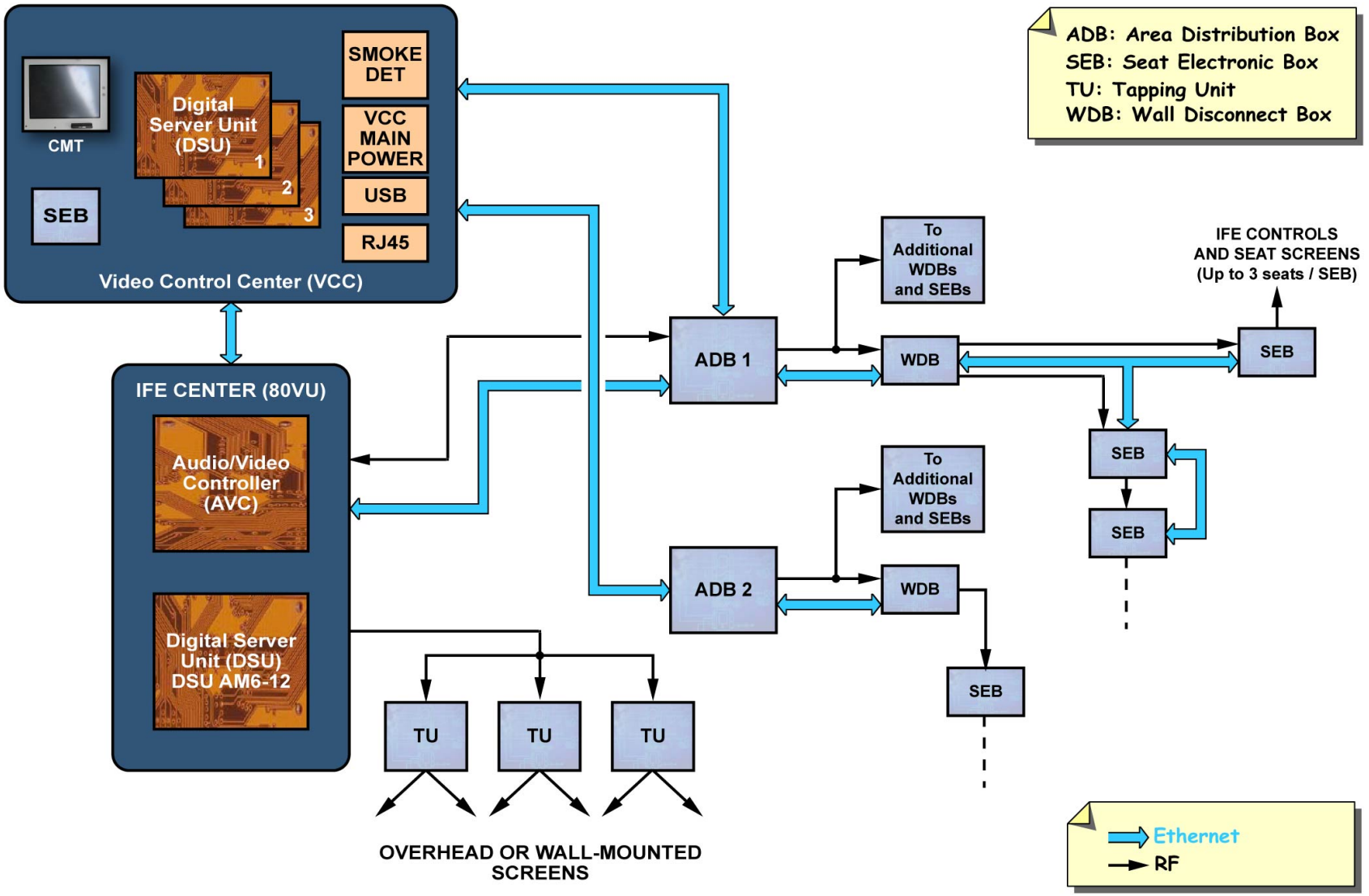


SYSTEM ARCHITECTURE ... VIDEO CONTROL CENTER (VCC)

IN-FLIGHT ENTERTAINMENT SYSTEM D/O (THALES) (OPTION) (3)

IFE COMPONENT DESCRIPTION

AUDIO VIDEO CONTROLLER (AVC)

The Audio Video Controller (AVC) is the main controller for the PES. It is used as an interface between VCC and cabin components and other aircraft system (CIDS, landscape camera). The AVC has 6 Ethernet signal transmission ports for high speed data transfer to/from PES components. The AVC receives audio/ video signals from the server (DSU-AM6-12) and modulates them onto RF signal to the passenger seat.
Passenger Service System (PSS) signals (Attendant Call/Reset, reading light control) and PA analog signal are sent from the AVC to the CIDS.

DIGITAL SERVER UNIT AM6-12 (DSU-AM6-12)

The Digital Server Unit AM6-12 (DSU-AM6-12) is the storage unit for audio/video broadcast (Airline video, News,...).
It also supplies Boarding Music (BMG), PRAM and PFIS.

DIGITAL SERVER UNIT (DSU-D2)

The Digital Server Units (DSUs) are used to store MPEG files for the AVOD and the games (D2 for 2 hard disks).

AREA DISTRIBUTION BOX (ADB)

The Area Distribution Boxes (ADBs) located in the cabin ceiling are used for routing received RF Audio/Video and Ethernet/AVOD signal transmission.

WALL DISCONNECT BOX (WDB)

The Wall Disconnect Boxes (WDBs) installed below the cabin floor, are used to route RF Audio/Video and Ethernet/AVOD data between the ADB and the Seat Electronic Boxes (SEBs). The WDB divides the signal to supply two outputs. One for each of 2 seat columns.

SEAT ELECTRONIC BOX (SEB)

The Seat Electronic Boxes (SEBs), installed at passenger seats, receive RF/Audio/video and Ethernet/AVOD signals from the WDBs.
The audio parts of the RF and AVOD signals are changed into 2 channels of analog audio for the passenger headset. The video part of the RF signal is changed into National Standards Committee (NTSC) signal and sent to the passenger video screen.
The video part of the AVOD signal is sent directly to the passenger video.

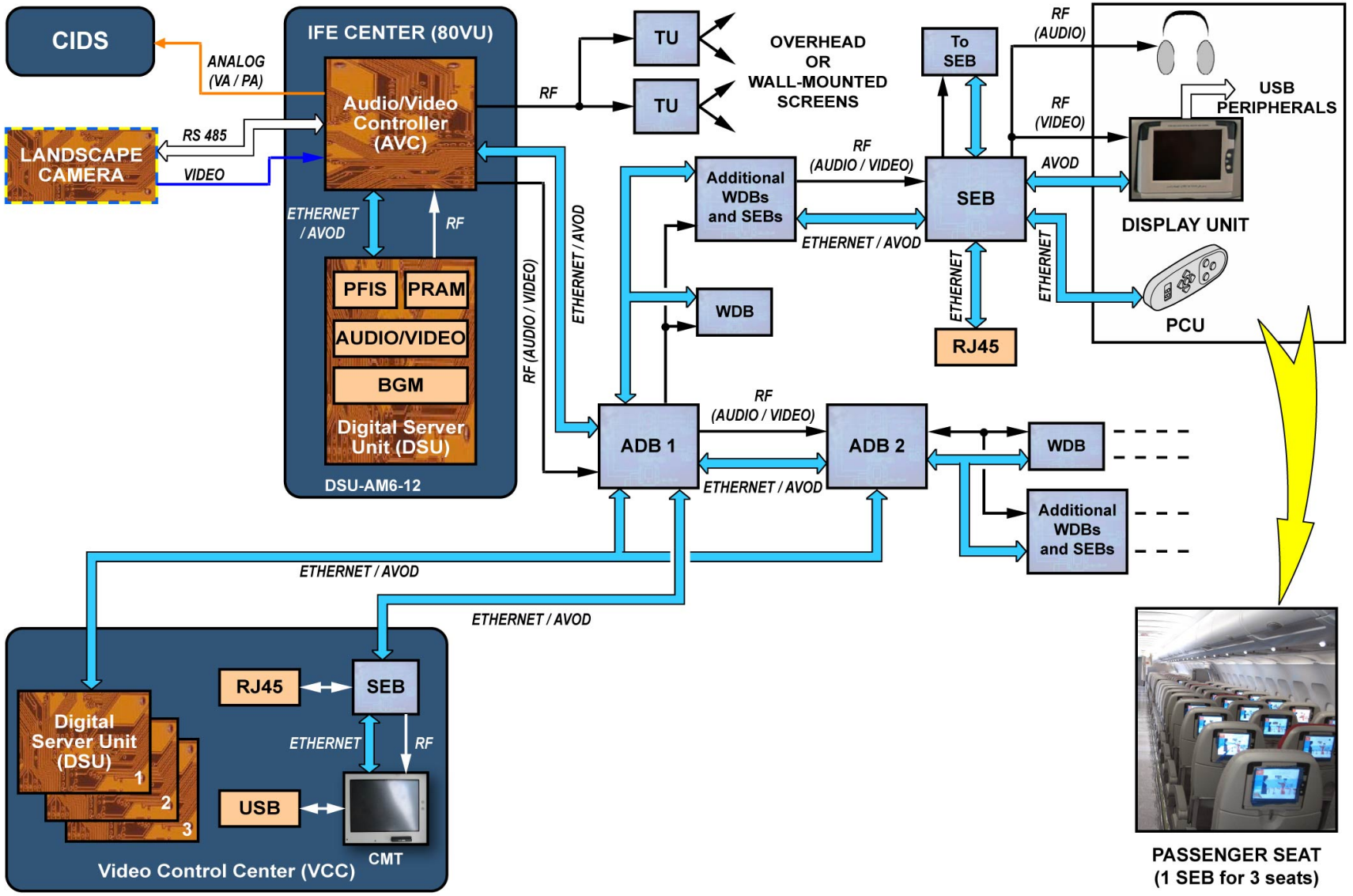
PASSENGER VIDEO SCREEN

The passenger video screens (or Display Unit (DU)) are color LCD screens.
The DUs receive an NTSC video signal and Ethernet data from the SEB. They perform digital interactive and games processing, MPEG (AVOD), and MP3 decoding within the display.

TAPPING UNIT

The Tapping Units (TUs) are installed in the passenger cabin.
The TU demodulates the RF video signal sent from the AVC to an NTSC video signal and transmitted to the overhead or wall mounted display units.

UGB13131 - U7ST0M0 - UM23DYIFE000001



IFE COMPONENT DESCRIPTION - AUDIO VIDEO CONTROLLER (AVC) ... TAPPING UNIT

UGB13131 - U7ST0M0 - UM23DYIFE000001

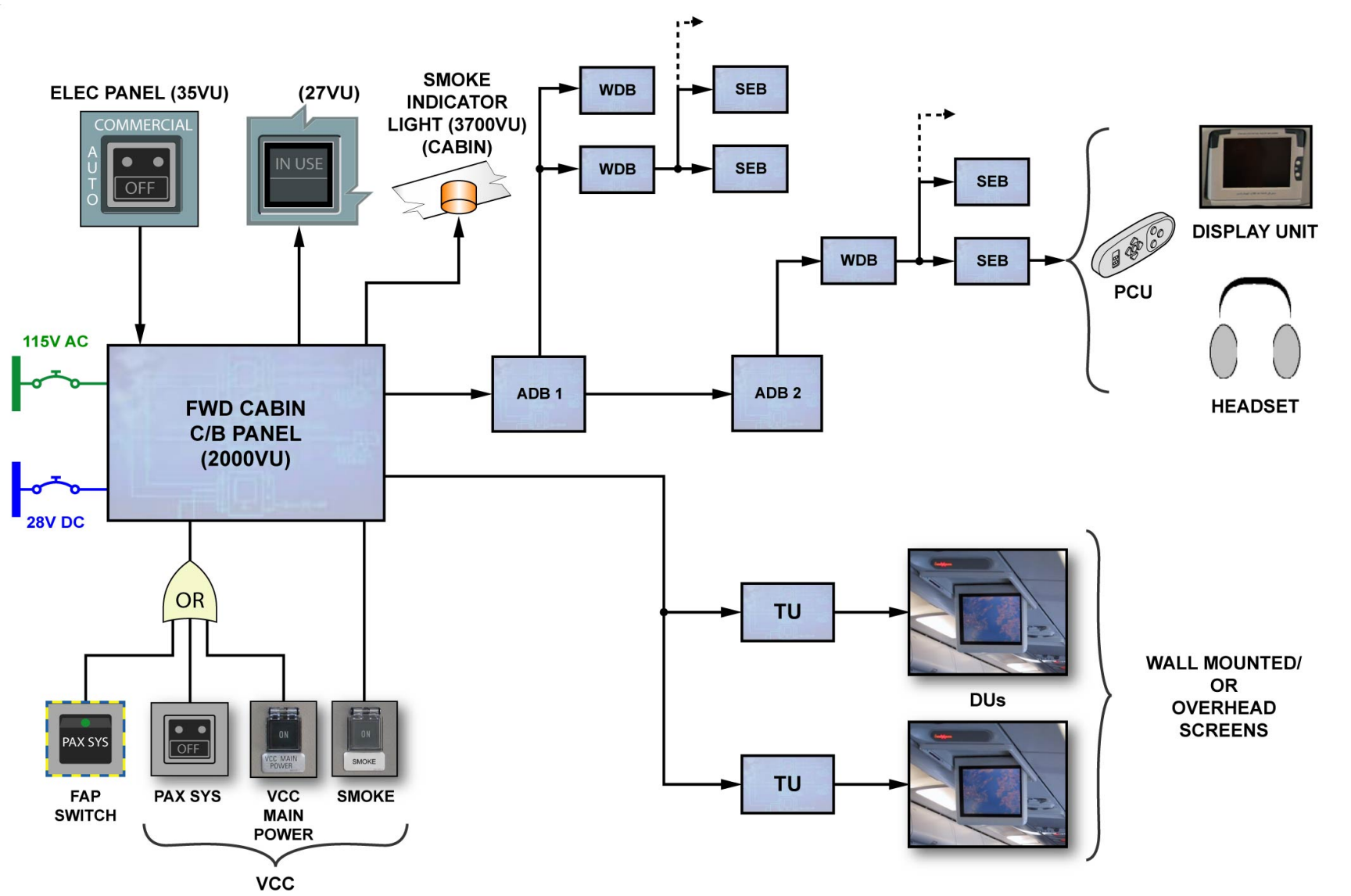
IN-FLIGHT ENTERTAINMENT SYSTEM D/O (THALES) (OPTION) (3)

POWER SUPPLY

The seat IFE components are powered from the Seat Power Supply System (SPSS).
It will be possible to switch off the IFE system and the SPSS from the cockpit and the VCC.
The IFE system is supplied through the FWD cabin C/B panel.
Two PAX SYS ON/OFF switches located in the VCC and on the Flight Attendant Panel (FAP) are used to cut off the power supply to the IFES.
A SMOKE light on the VCC comes on when the IFE system is energized (smoke detection system in operation).
If smoke is detected in the VCC:
- SMOKE light on the VCC start to flash,
- Smoke indication light in the cabin comes on,
- Audio/video services to the passengers stop,
- IFE is de-energized.

The COMMERCIAL cockpit switch can also control the IFES.
The VCC is directly connected to the cabin C/B panel. It has a VCC MAIN switch, which cuts off the supply of all the IFE related systems.
A IN USE indicator light comes on in the cockpit when the VCC MAIN switch is ON.
The overhead network is supplied through the TUs.
The seat network is supplied through the ADBs from 115V AC busbar.
Moreover each seat has C/Bs.

UGB13131 - U7ST0M0 - UM23DYIFE000001



POWER SUPPLY

IN-FLIGHT ENTERTAINMENT SYSTEM D/O (THALES) (OPTION) (3)

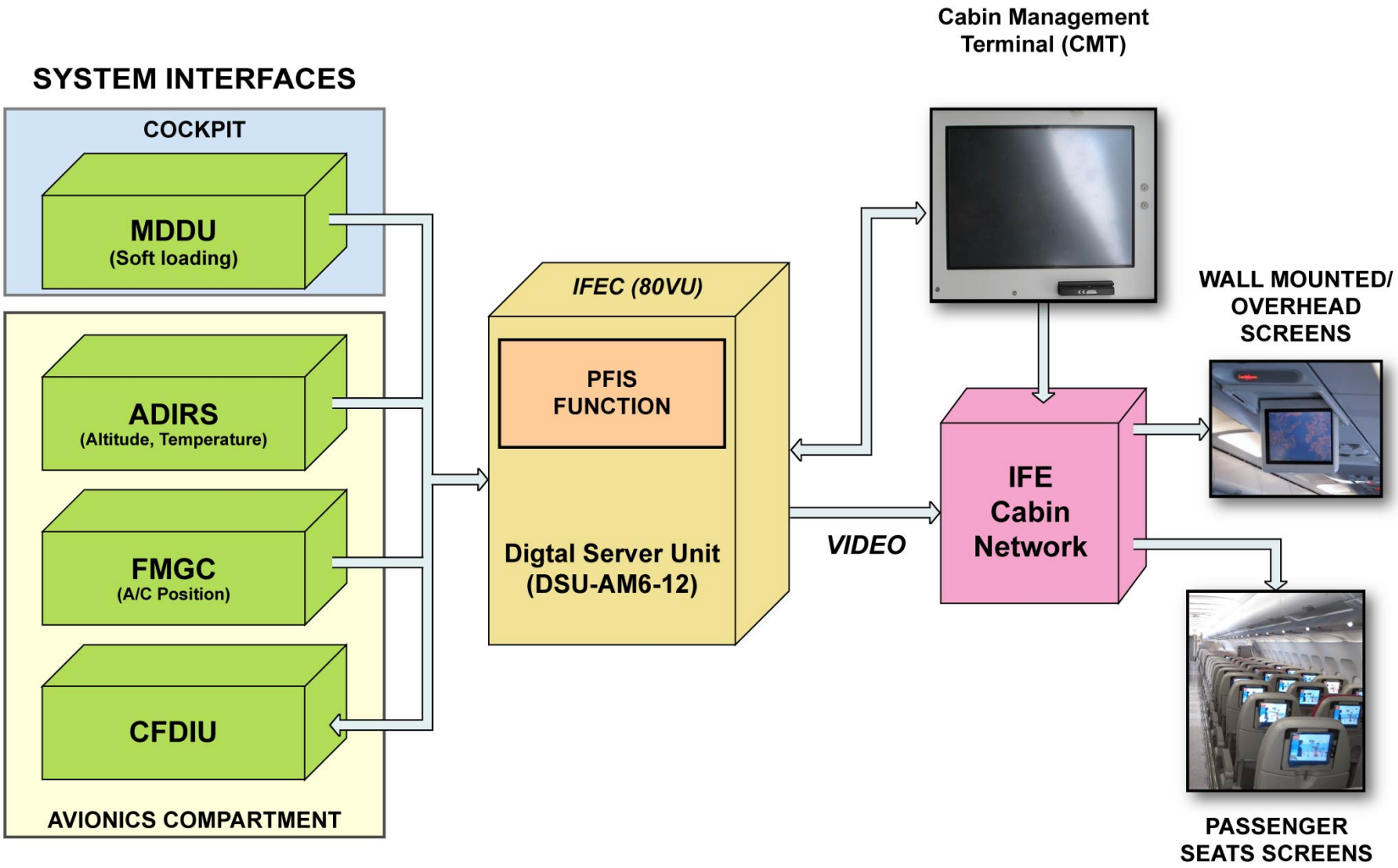
SYSTEM INTERFACE

The IFE system also interfaces with the following A/C systems:
- Passenger Flight Information System (PFIS),
- Landscape Camera (Option).

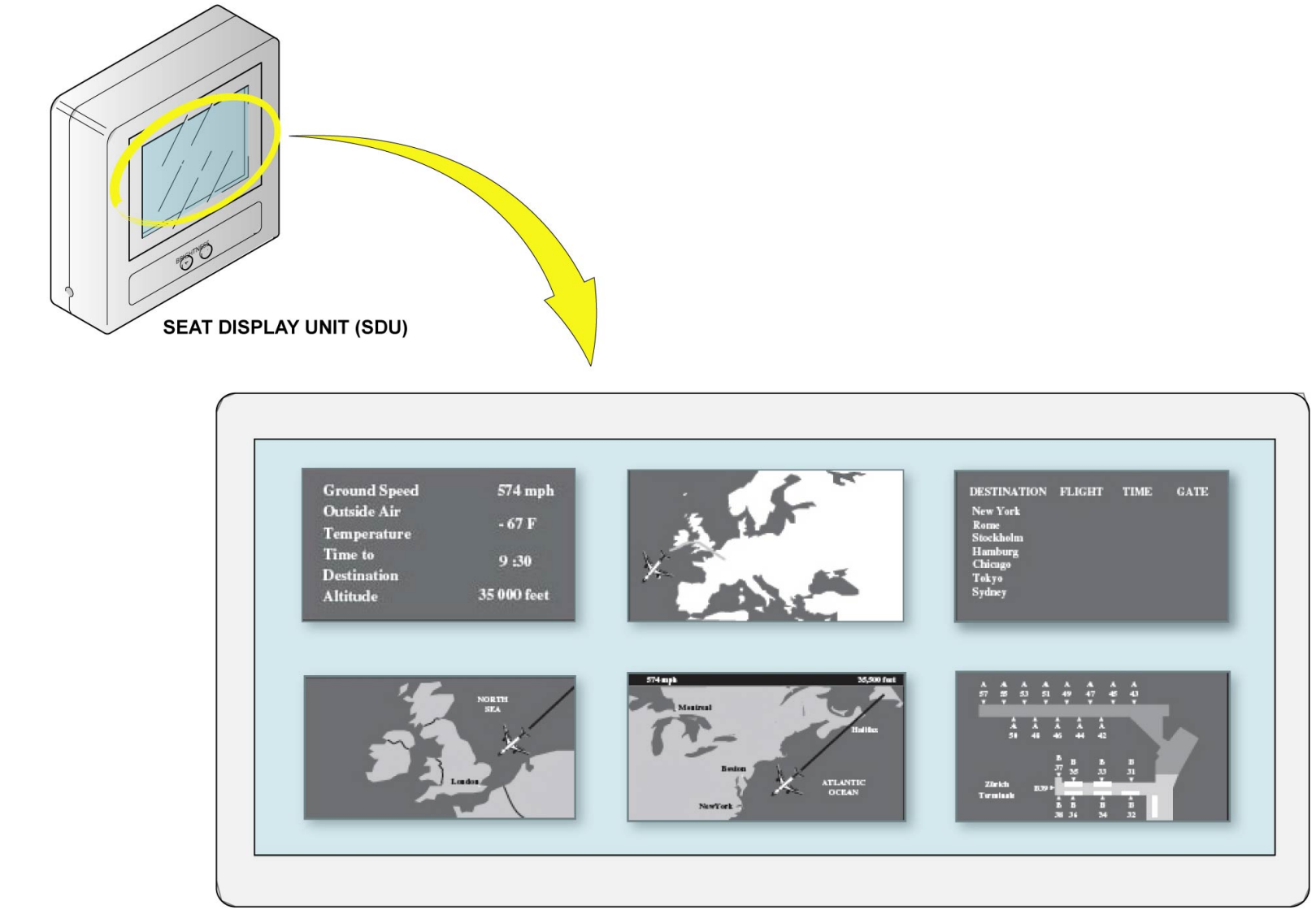
PFIS SYSTEM DESCRIPTION

The Passenger Flight Information System (PFIS) continuously gives updated flight and destination to the passengers via IFE video monitors. The PFIS function is achieved via software loaded in the IFE server installed in the IFEC (80VU) - (DSU-AM6-12).
Depending on the A/C position send by the Flight Management and Guidance Computer (FMGC), the DSU gives video sequences to the passengers (For example A/C mock-up, twenty overflown points of interest, altitude, temperature etc...).
PFIS data from DSU are sent through the audio/video Controller (AVC), which can be broadcasted on the overhead or wall-mounted screens or on the passenger screens.

UGB13131 - U7ST0M0 - UM23DYIFE000001



SYSTEM INTERFACE - PFIS SYSTEM DESCRIPTION



SYSTEM INTERFACE - PFIS SYSTEM DESCRIPTION

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IN-FLIGHT ENTERTAINMENT SYSTEM D/O (THALES) (OPTION) (3)

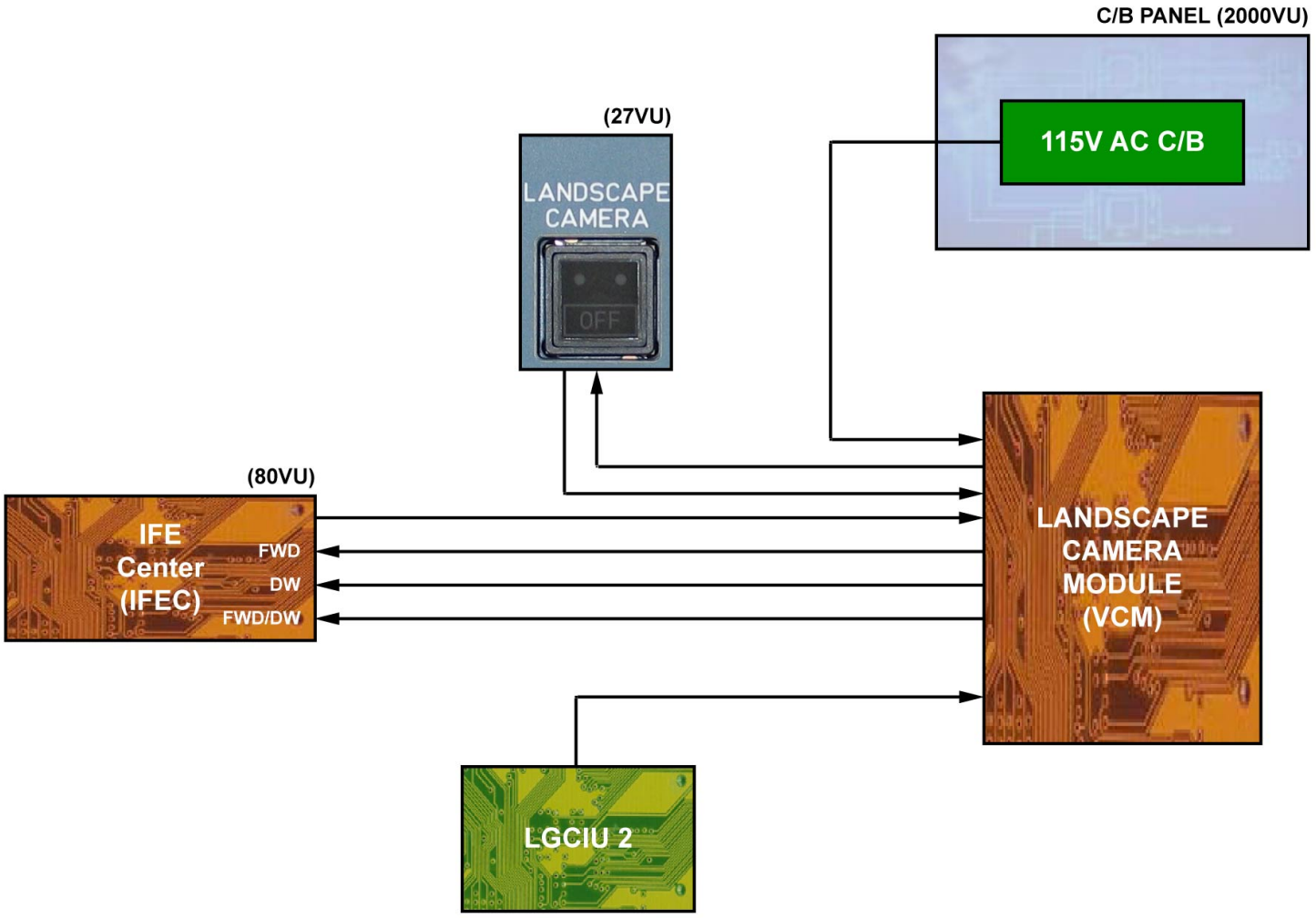
SYSTEM INTERFACE (continued)

LANDSCAPE CAMERA (OPTION)

The Landscape Camera System has a Video Camera Module (VCM).
The VCM is composed of:
- 2 video cameras in the bottom part (VCM-L),
- the electronics devices in the top part (VCM-H),

The VCM-H processes the video signal from the cameras and controls them to interface with the A/C.
Depending on the landing gear condition (downlocked or retracted), the video channels of the landscape camera system show either the horizontal view or both horizontal and vertical views.
A master switch, located on the cockpit overhead panel is installed in order to stop the video output of the cameras (in case of turbulence).

UGB13131 - U7ST0M0 - UM23DYIFE000001



SYSTEM INTERFACE - LANDSCAPE CAMERA (OPTION)

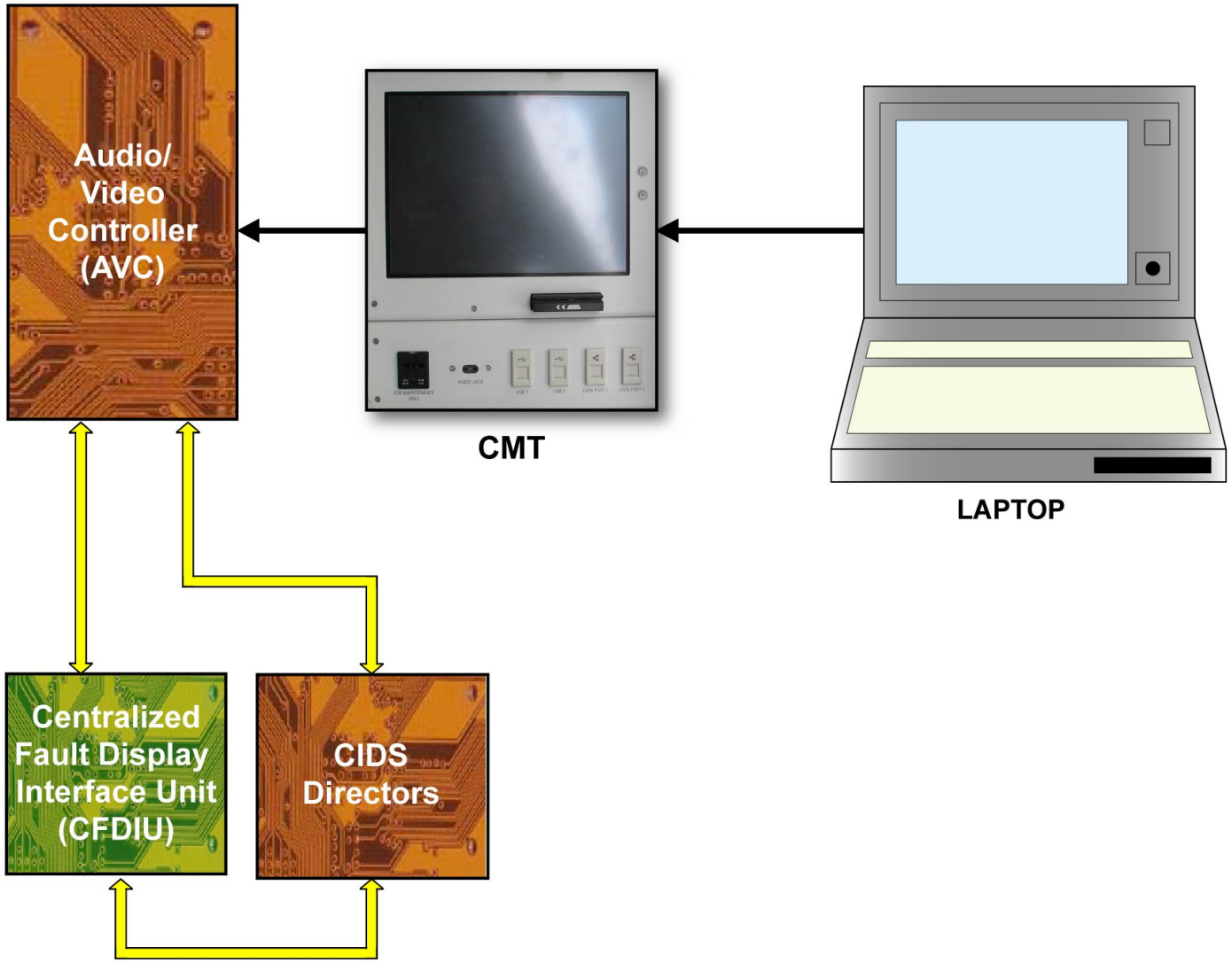
IN-FLIGHT ENTERTAINMENT SYSTEM D/O (THALES) (OPTION) (3)

BITE

The BITE data are stored in the AVC memories. Specific interactive maintenance menus are directly accessible from the VCC using the Cabin Management Terminal (CMT).
The CMT is the primary Passenger Entertainment System (PES) interface for the flight attendants and the maintenance personnel. The CMT is a graphic interface and supplies the subsequent following functions:
- Control of video distribution to cabin zones,
- Cabin configuration management,
- Control of peripherals, such as preview of video and audio programs, monitor ON/OFF control, monitor lockout, airshow operation and VTR control,
- Start of BITE requests to all connected LRUs, (through the maintenance menu AFTER ENTERING AN ACCESS CODE).
- Software load and configuration reports,
- Player controls, entertainment and passenger address, movie and video game lockout,
- Engineering test.

An internal Bite is done automatically at power up and can be manually initiated from the CMT.
A function test is also made continuously during PES operation.

UGB13131 - U7ST0M0 - UM23DYIFE000001


Audio/
Video
Controller
(AVC)
CMT
LAPTOP
Centralized
Fault Display
Interface Unit
(CFDIU)
CIDS
Directors

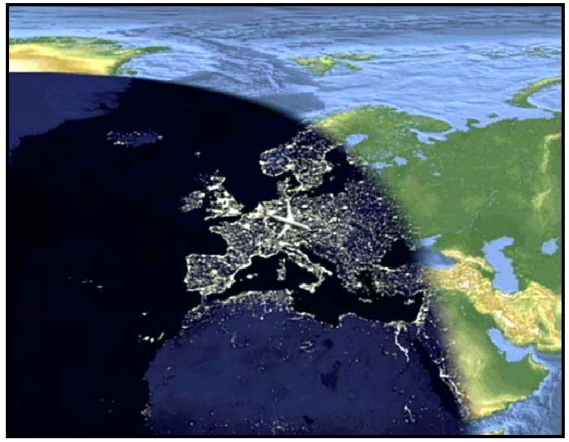
BITE

PAX VISUAL INFORMATION SYS D/O (OPTION) (3)

PRESENTATION

The Passenger Visual Information System (PVIS), provides continuously updated flight and destination information to the passengers on the video Display Units (DUs). Information is given to the passengers either in text form or/and in multicolored maps. Several modes can be selected:
- MAP mode: Map display,
- INFO mode: Flight information pages,
- LOGO mode: Logo display,
- AUTO mode: Automatic cycling of the modes.

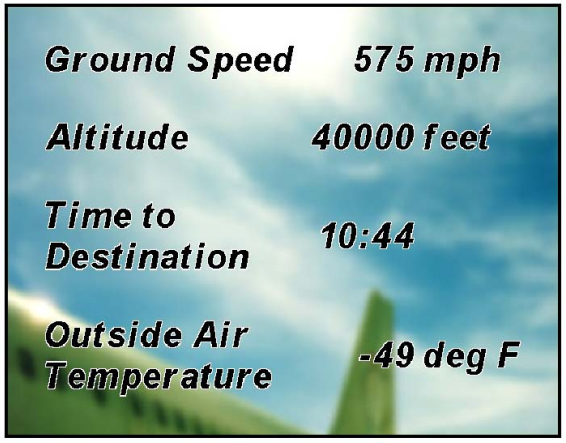
UGB13131 - U7ST0M0 - UM23DW000000001



LOW RESOLUTION MAP GIVING
THE POSITION OF THE AIRCRAFT

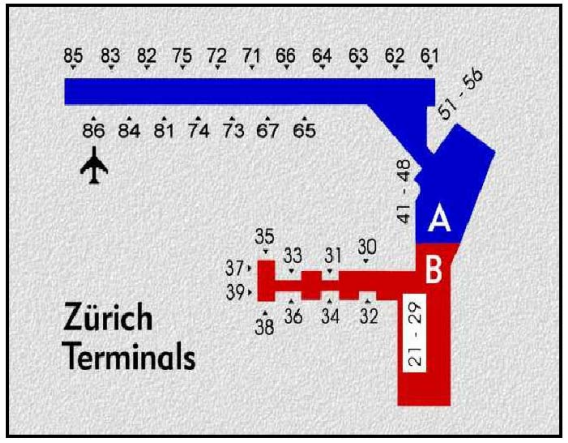
HIGH RESOLUTION MAP GIVING
THE DESTINATION AND THE
EXACT POSITION

LOW RESOLUTION MAP GIVING
THE POSITION OF THE AIRCRAFT
WITH FLIGHT INFORMATION



FLIGHT INFORMATION
IN TEXT MODE

CONNECTING GATE INFORMATION
TRANSMITTED TO THE ATSU



TERMINAL CHART

PRESENTATION

PAX VISUAL INFORMATION SYS D/O (OPTION) (3)

DIU

The PVIS comprises the Digital Interface Unit (DIU) and the remote control unit. The DIU is the main computer of the PVIS. It is connected to the aircraft avionics systems and to the Passenger Entertainment System (PES) video. The DIU interfaces with:
- the Air Data/Inertial Reference System (ADIRS),
- the Flight Management and Guidance System (FMGS),
- the PES video,
- the Centralized Fault Display System (CFDS).

The DIU processes all the information and selects the appropriate maps and points of interest stored in its memory. The DIU is also connected to other systems:
- the Air Traffic and Information Management System (ATIMS),
- the cabin management system.

The DIU is supplied with 28V DC and powered via the Video Control Center (VCC) master switch. The remote control unit is the input device for the PVIS. The remote control unit front plate has four P/BSWs and a Liquid Crystal Display (LCD) character control screen.

NOTE: The DIU brings digital data stored in its internal memory (CD-ROM).

ADIRS

The Air Data/Inertial Reference Unit (ADIRU) 2 is connected to the DIU through two unidirectional ARINC 429 data buses:
- an ARINC 429 low speed data bus transmits the actual air data,
- an ARINC 429 high speed data bus transmits the inertial reference data.

FMGs

The Flight Management and Guidance Computer (FMGC) 2 is connected to the DIU through an unidirectional ARINC 429 data bus, in order to send data to the DIU. Certain parameters requiring an input (destination, flight time,...) can be entered either by the cabin staff or loaded from FMGC.

CFDS

The Centralized Fault Display Interface Unit (CFDIU) is connected to the DIU through a unidirectional ARINC 429 low speed data bus for maintenance purposes.

ATIMS

The Air Traffic Service Unit (ATSU) is connected to the DIU through an ARINC 429 low speed data bus. The ATSU allows connecting gate, arrival information, messages and other data to be up-linked from ground stations.

CABIN MANAGEMENT SYSTEM

The cabin management system is connected to the DIU through an ARINC 429 low speed data bus. The cabin management system controls and monitors the PVIS by means of the lap top computer.

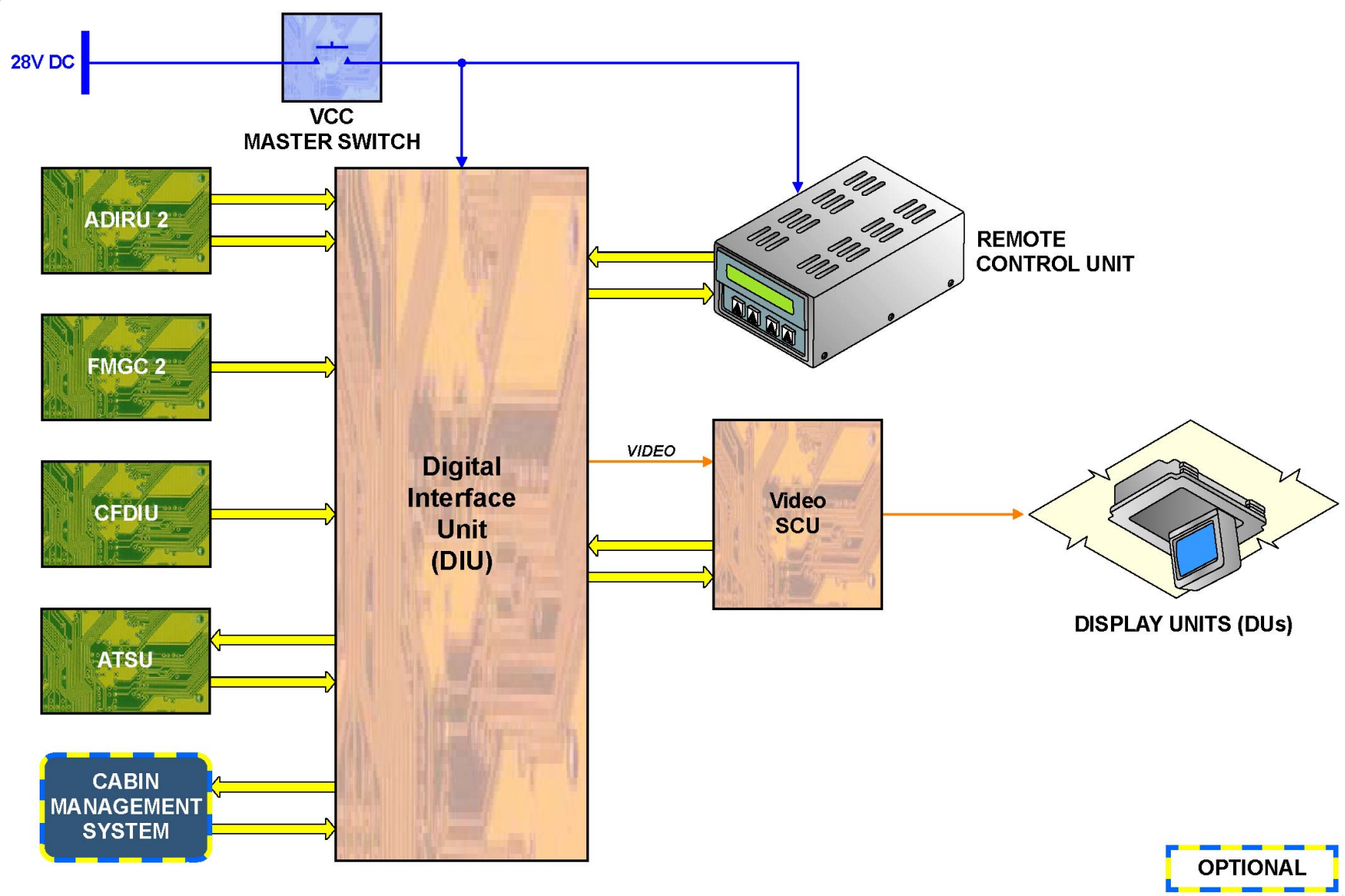
OPERATION

The DIU reads data from the FMGCs and the ADIRUs through ARINC 429 data buses. These data are used for DIU memory access from where information is processed, formatted and transmitted as a video signal to the PES video. The video System Control Unit (SCU) transmits this information to the DUs to be shown.

BITE

A test is done automatically at power-up or manually from the control unit. The result of this test is transmitted to the video SCU.

UGB13131 - U7ST0M0 - UM23DW000000001


28V DC
VCC
MASTER SWITCH
ADIRU 2
FMGC 2
CFDIU
ATSU
CABIN
MANAGEMENT
SYSTEM
Digital
Interface
Unit
(DIU)
REMOTE
CONTROL UNIT
VIDEO
Video
SCU
DISPLAY UNITS (DUs)
OPTIONAL

DIU ... BITE

CABIN MANAGEMENT SYSTEM D/O (3)

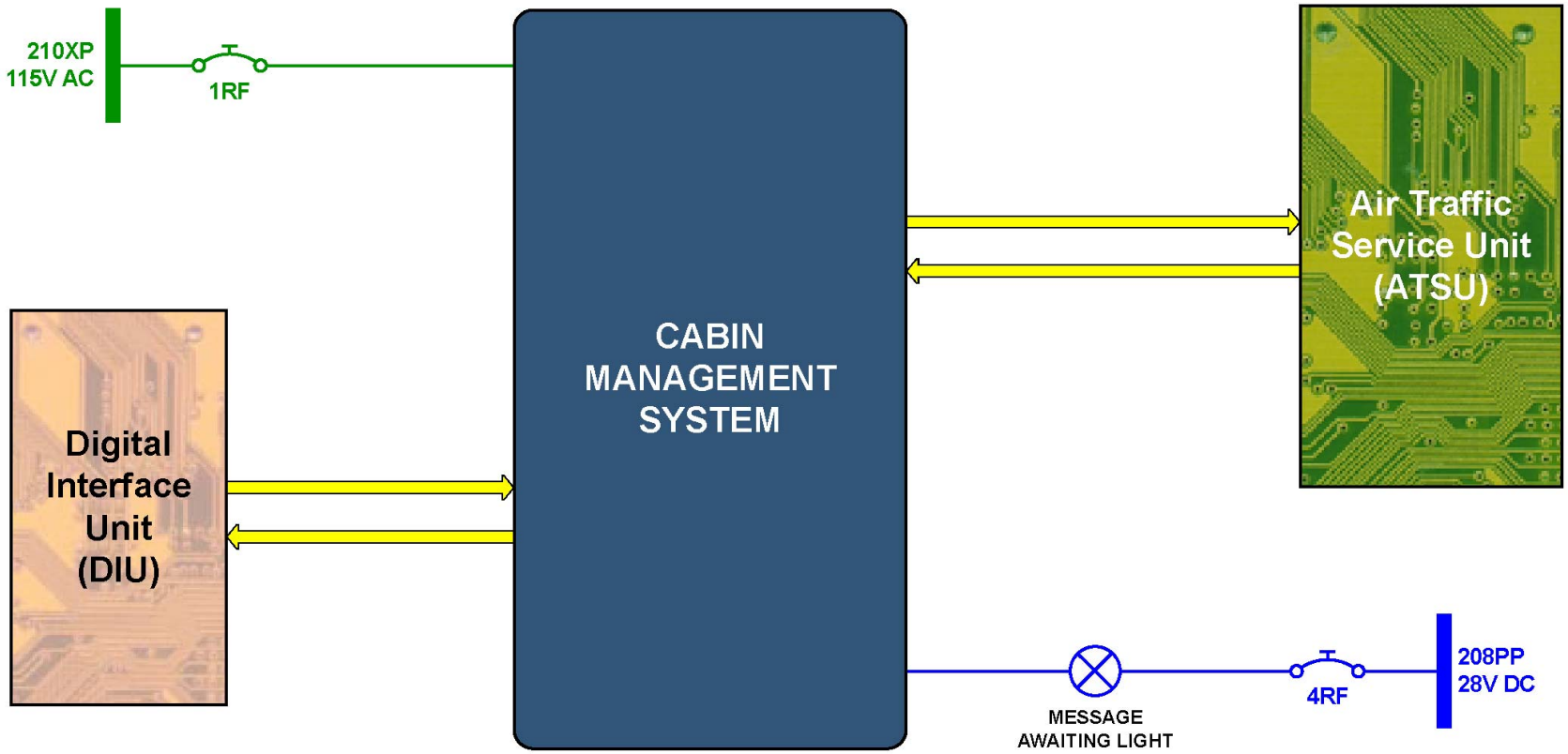
CABIN MANAGEMENT SYSTEM

The cabin management system provides a direct contact for the cabin crew with the ground via the Air Traffic Service Unit (ATSU). The cabin management system controls and monitors the Passenger Visual Information System (PVIS) via the Digital Interface Unit (DIU). The attendants use the system to send and receive real time data on for example passenger and security information, maintenance reports.

TEST

The cabin management system has a BITE. The test is done when the system is powered-up.

UGB13131 - U7ST0M0 - UM23DX000000001



CABIN MANAGEMENT SYSTEM & TEST

CABIN MANAGEMENT SYSTEM D/O (3)

CABIN MANAGEMENT SYSTEM COMPONENTS

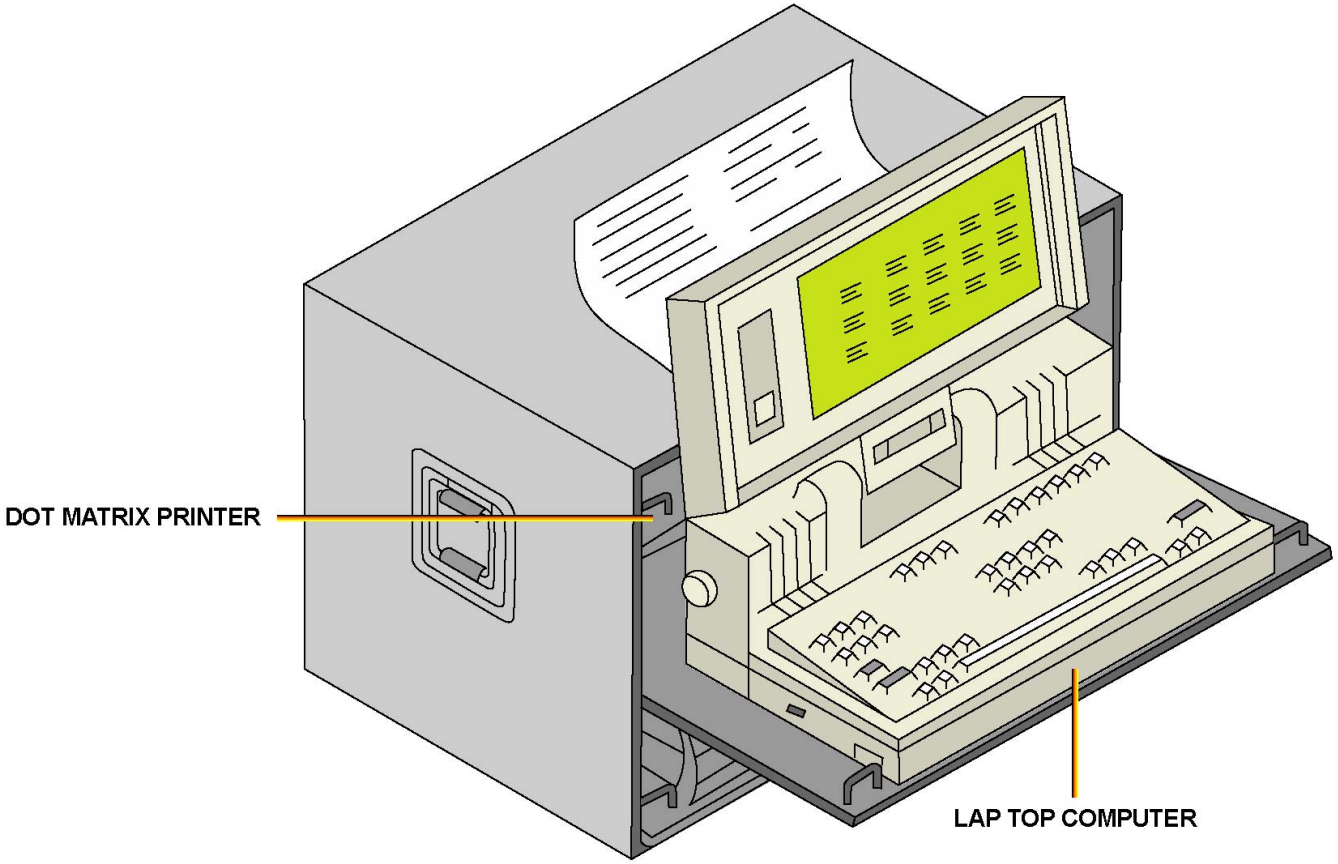
The cabin management system is composed of:
- a laptop computer,
- a dot matrix printer,
- an interface assembly,
- a message awaiting light.

The interface is provided with two sliding drawers, the lower for the computer and the upper for the printer. It is also equipped with a power supply circuit board and an interface circuit board. The message awaiting light indicates that information has been received from a ground station.

OPERATION

All system controls and data entries are performed on the laptop computer. The software provides guidance for the operator to use the system. All functions are available through selection from the display. To operate the cabin management system, first the printer drawer has to be unlocked and pulled forward then pushed back to the locked position. After that, the computer drawer has to be unlocked and pulled forward, then the computer can be switched on.

UGB13131 - U7ST0M0 - UM23DX000000001



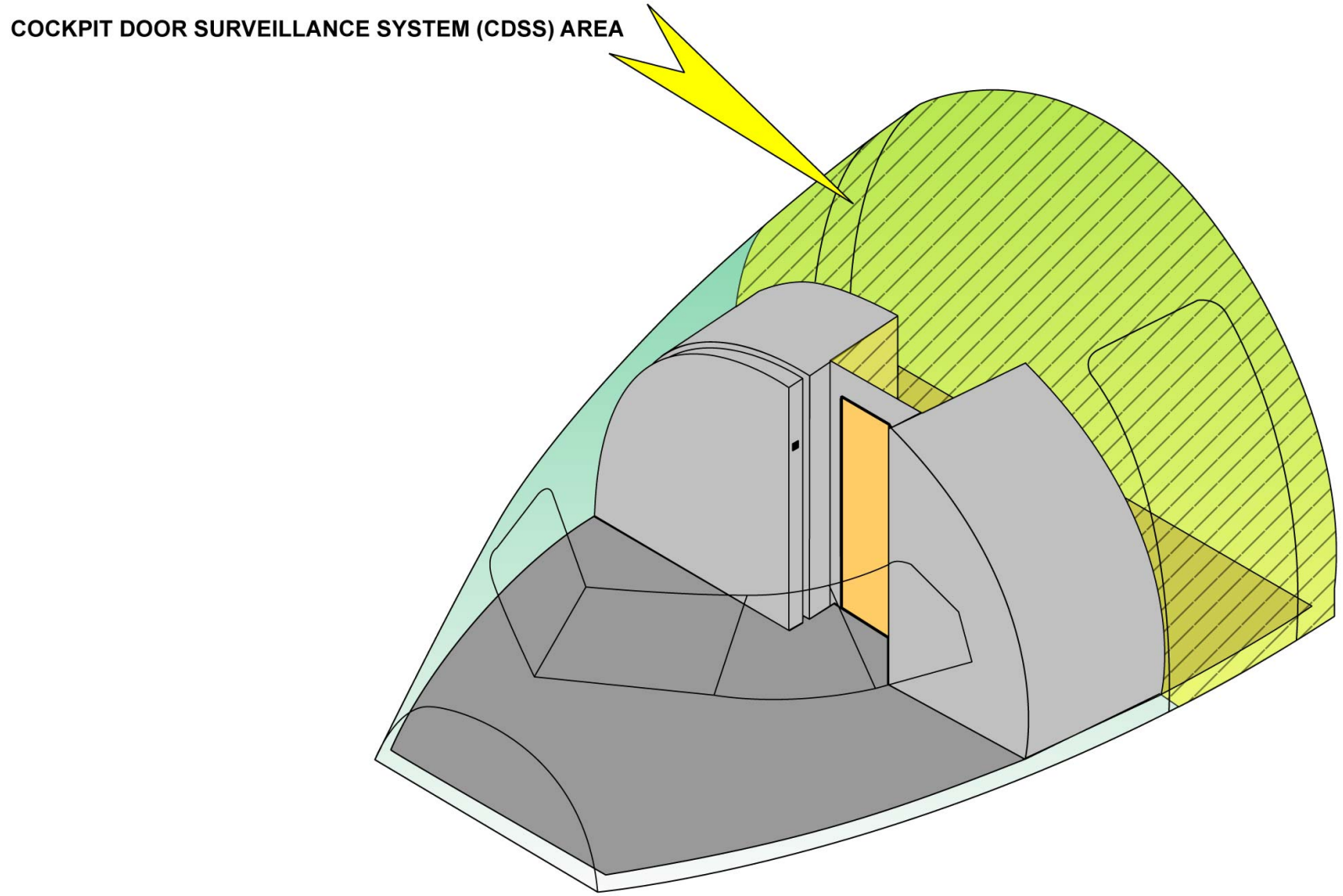
CABIN MANAGEMENT SYSTEM COMPONENTS & OPERATION

COCKPIT DOOR SURVEILLANCE SYS D/O (OPTION) (3)

GENERAL

A Cockpit Door Surveillance System (CDSS) is installed on top of the wiring provisions to let the flight crew identify a person in front of the cockpit door and to monitor the hidden cross section in the door number 1 area.

UGB13131 - U7ST0M0 - UM23DZCDSS00001



GENERAL

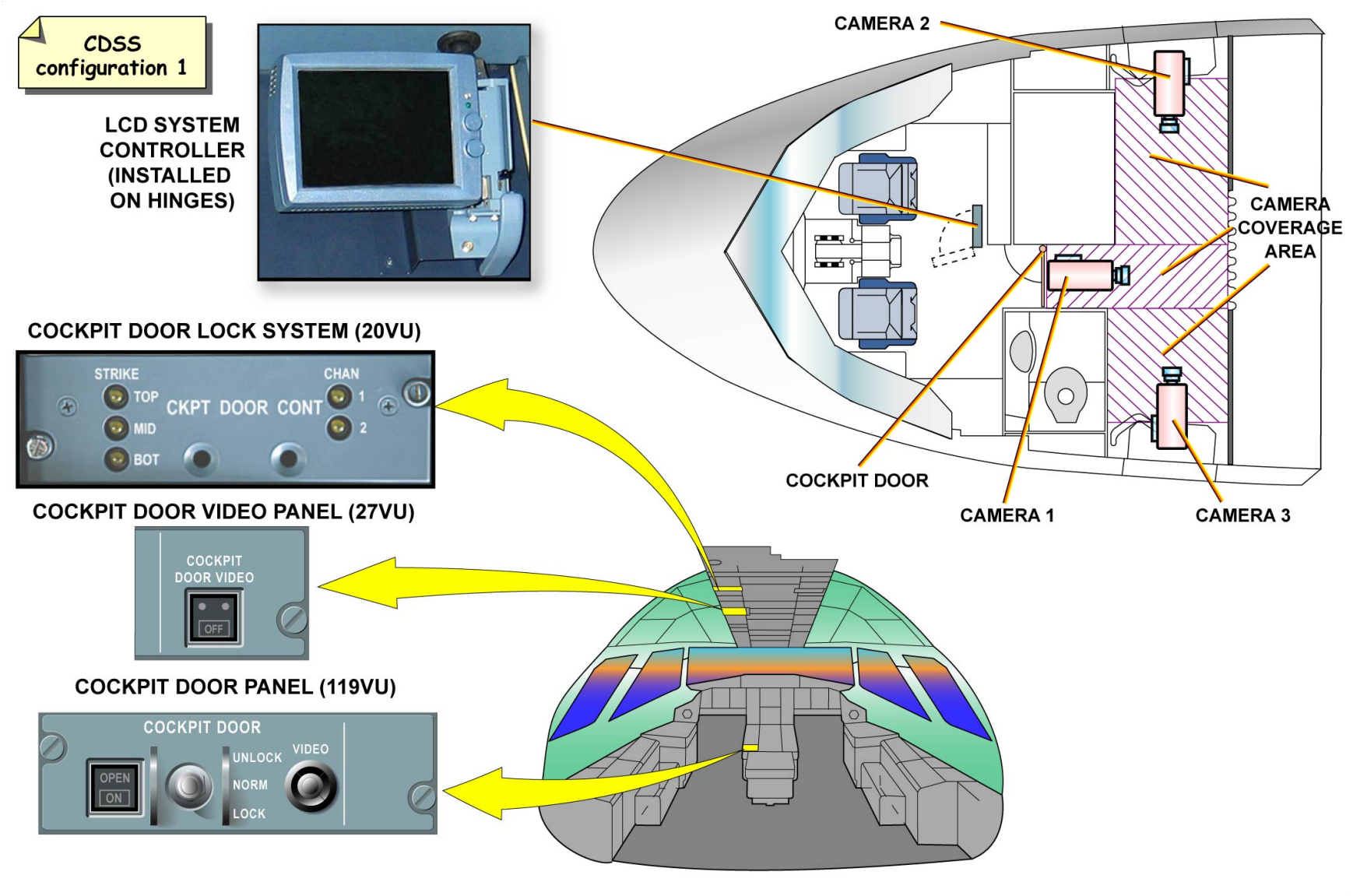
COCKPIT DOOR SURVEILLANCE SYS D/O (OPTION) (3)

COMPONENTS & LOCATION

Two types of CDSS can be installed. The first configuration has the following components:
- 3 "NTSC video format" black and white video cameras in the door number 1 area,
- 1 LCD installed on the rear cockpit wall,
- 1 ON/OFF P/BSW installed on the COCKPIT DOOR VIDEO panel,
- 1 camera select momentary P/B installed on the COCKPIT DOOR panel,
- an entry request discrete from the cockpit door lock system.

The second configuration has the following components:
- 3 "NTSC video format" black and white video cameras in the door number 1 area,
- 1 ON/OFF P/BSW installed on the COCKPIT DOOR VIDEO panel,
- 1 camera select switch and a video select rotary switch installed on the COCKPIT DOOR panel,
- 1 CDSS system controller, installed in the avionics bay, to process and display images on the lower ECAM System Display (SD).

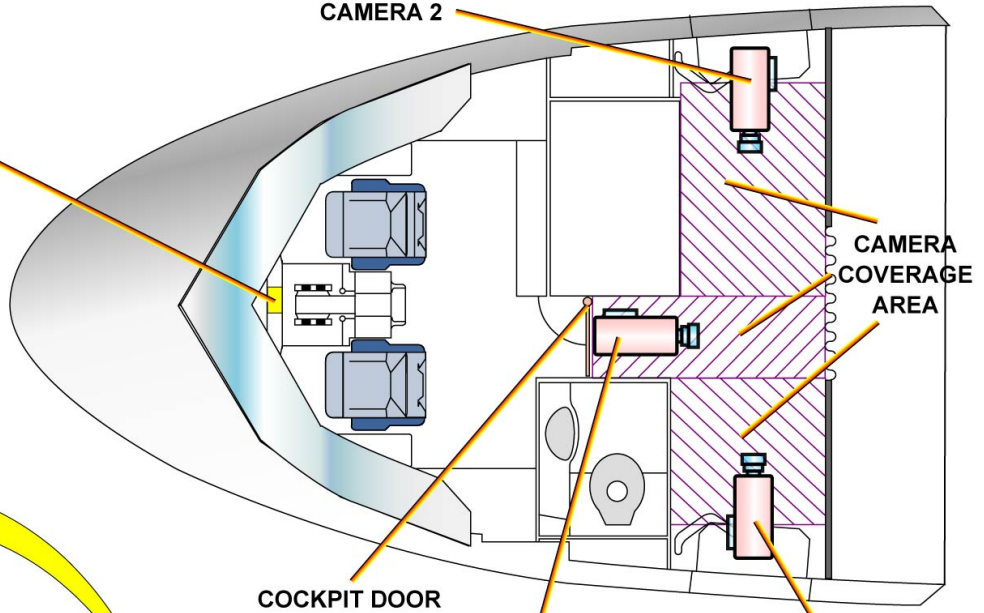
UGB13131 - U7ST0M0 - UM23DZCDSS00001



COMPONENTS & LOCATION

CDSS configuration 2

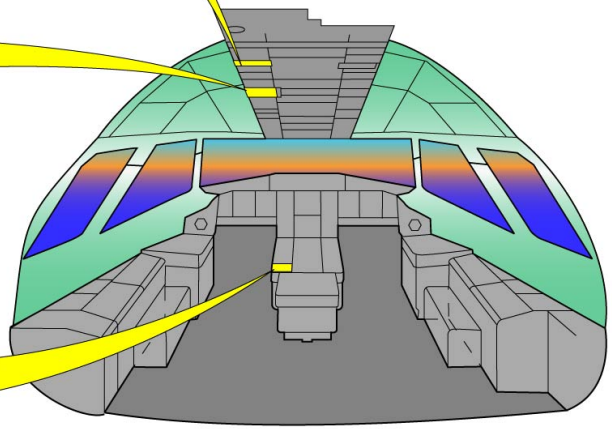
SYSTEM DISPLAY (SD)



COCKPIT DOOR LOCK SYSTEM (20VU)

COCKPIT DOOR VIDEO PANEL (27VU)

COCKPIT DOOR PANEL (119VU)



CDSS SYSTEM CONTROLLER

COMPONENTS & LOCATION

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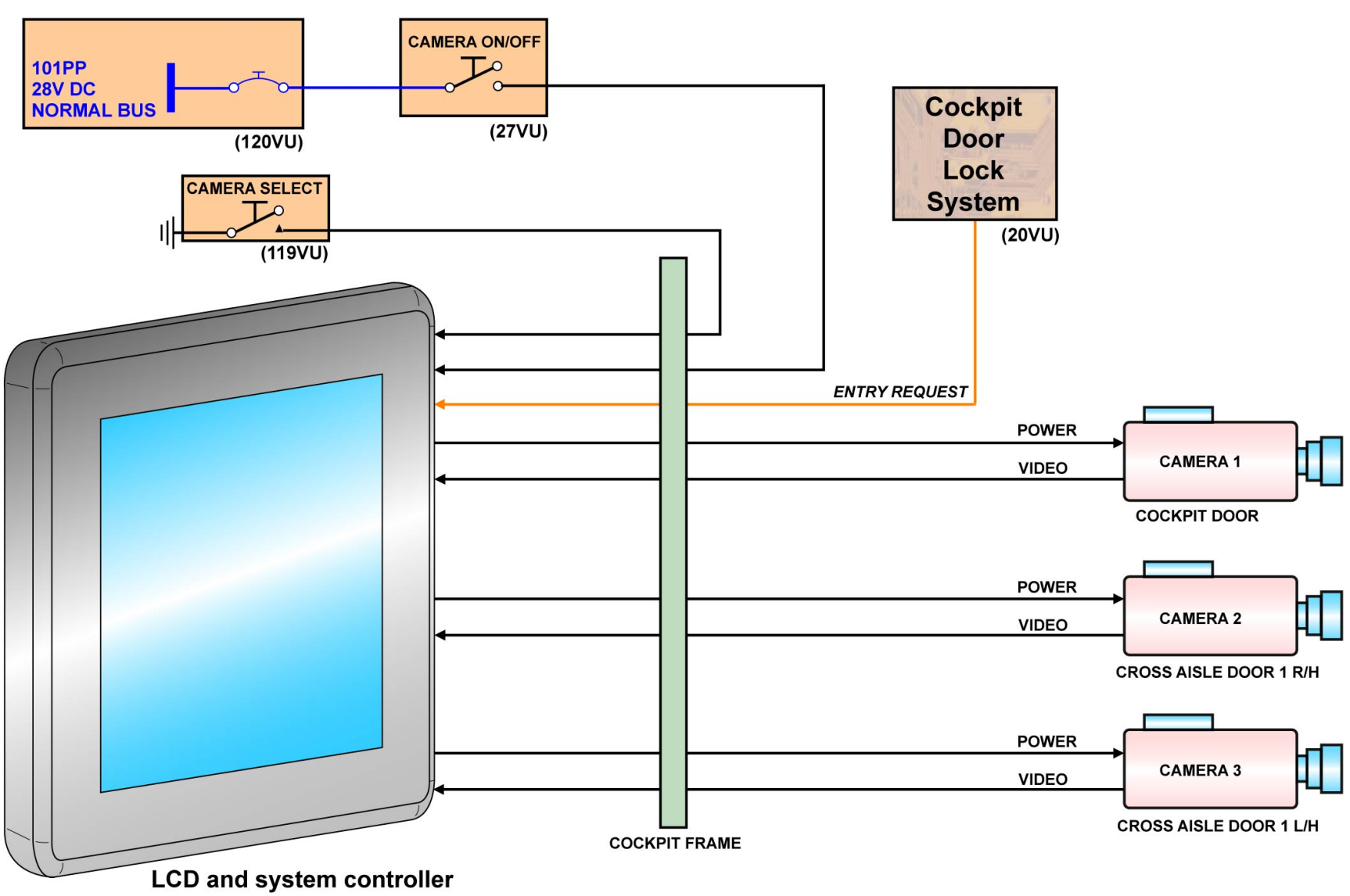
UGB13131 - U7ST0M0 - UM23DZCDSS00001

COCKPIT DOOR SURVEILLANCE SYS D/O (OPTION) (3)

DESCRIPTION - VIDEO IMAGES DISPLAYED ON LCD

The CDSS has:
- three "NTSC video format" black and white video cameras. Each camera is hidden in a flight attendant working light housing and has an infrared light. One video camera installed above the cockpit door lets you identify clearly the person who requests entrance to the cockpit. A second video camera installed in the ceiling near RH door no.1 lets you identify a person hidden behind the lavatory wall and galley. A third video camera installed in the ceiling near LH door no.1 has the same function as the second camera,
- one pivoting hinge 6.4" LCD with system controller to let the crew see the pictures from the cameras,
- one ON/OFF P/BSW to activate or deactivate the system,
- one camera select momentary P/B. The CDSS can be changed from the cockpit door camera to the covering areas of the two cameras between the doors,
- an entry request discrete from the cockpit door lock system to activate the CDSS from power safe mode and change automatically to camera 1 if a person requests entrance to the cockpit.

UGB13131 - U7ST0M0 - UM23DZCDSS00001



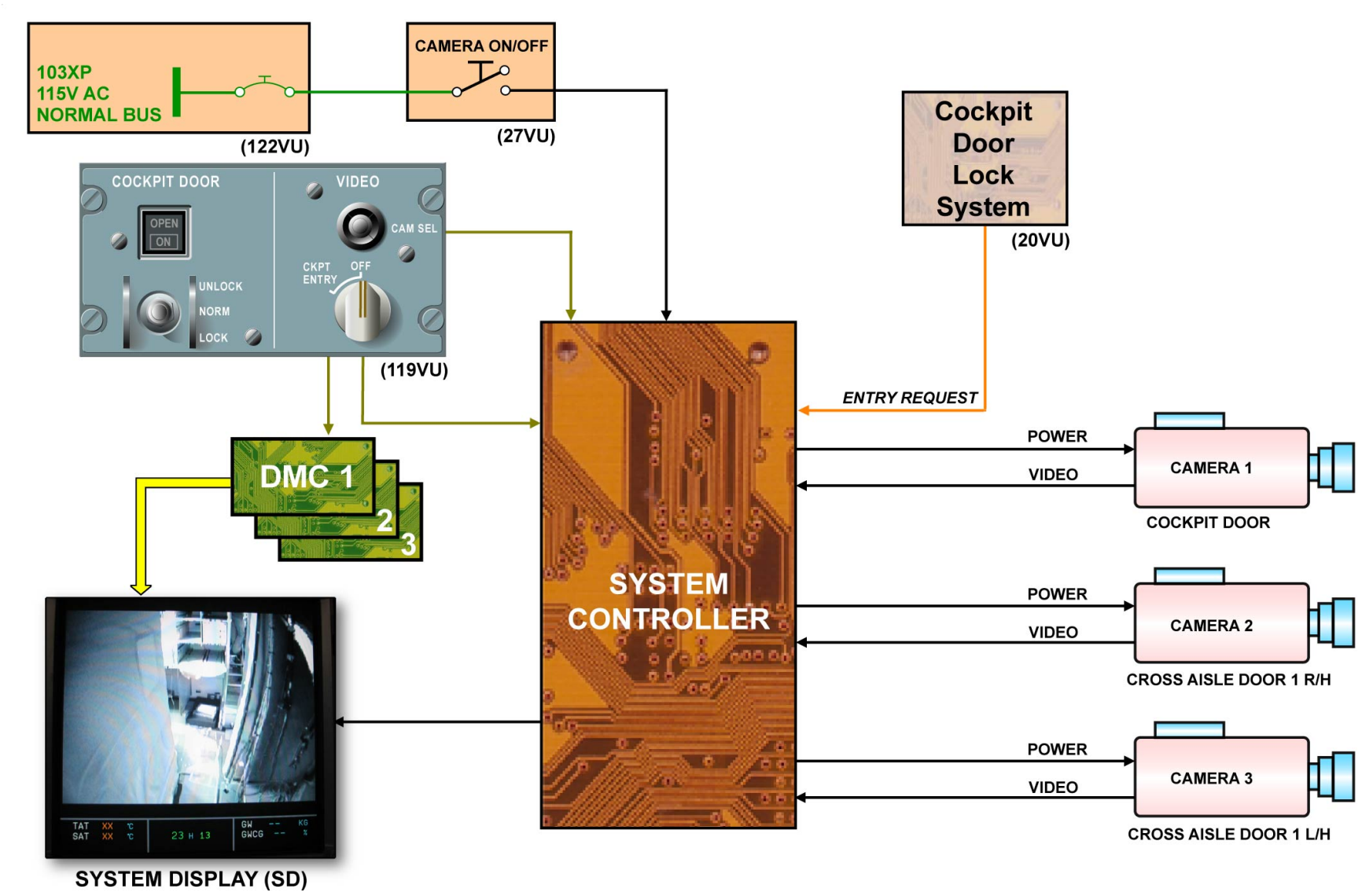
DESCRIPTION - VIDEO IMAGES DISPLAYED ON LCD

COCKPIT DOOR SURVEILLANCE SYS D/O (OPTION) (3)

DESCRIPTION - VIDEO IMAGES DISPLAYED ON SYSTEM DISPLAY

The CDSS has:
- three "NTSC video format" black and white video cameras with LCD display,
- one ON/OFF P/BSW to activate or deactivate the system,
- a system controller supplied by 115V AC through the COCKPIT DOOR VIDEO P/B. It gives 12V DC electrical power to energize the cameras. The system controller receives input signals from the cameras and also monitors the status of the CDSS. It processes the signal from the cameras and gives a video feed signal to the SD,
- a video select rotary switch to display the video images on the SD,
- a camera select switch to select a camera and which image will be sent to the SD.

UGB13131 - U7ST0M0 - UM23DZCDSS00001



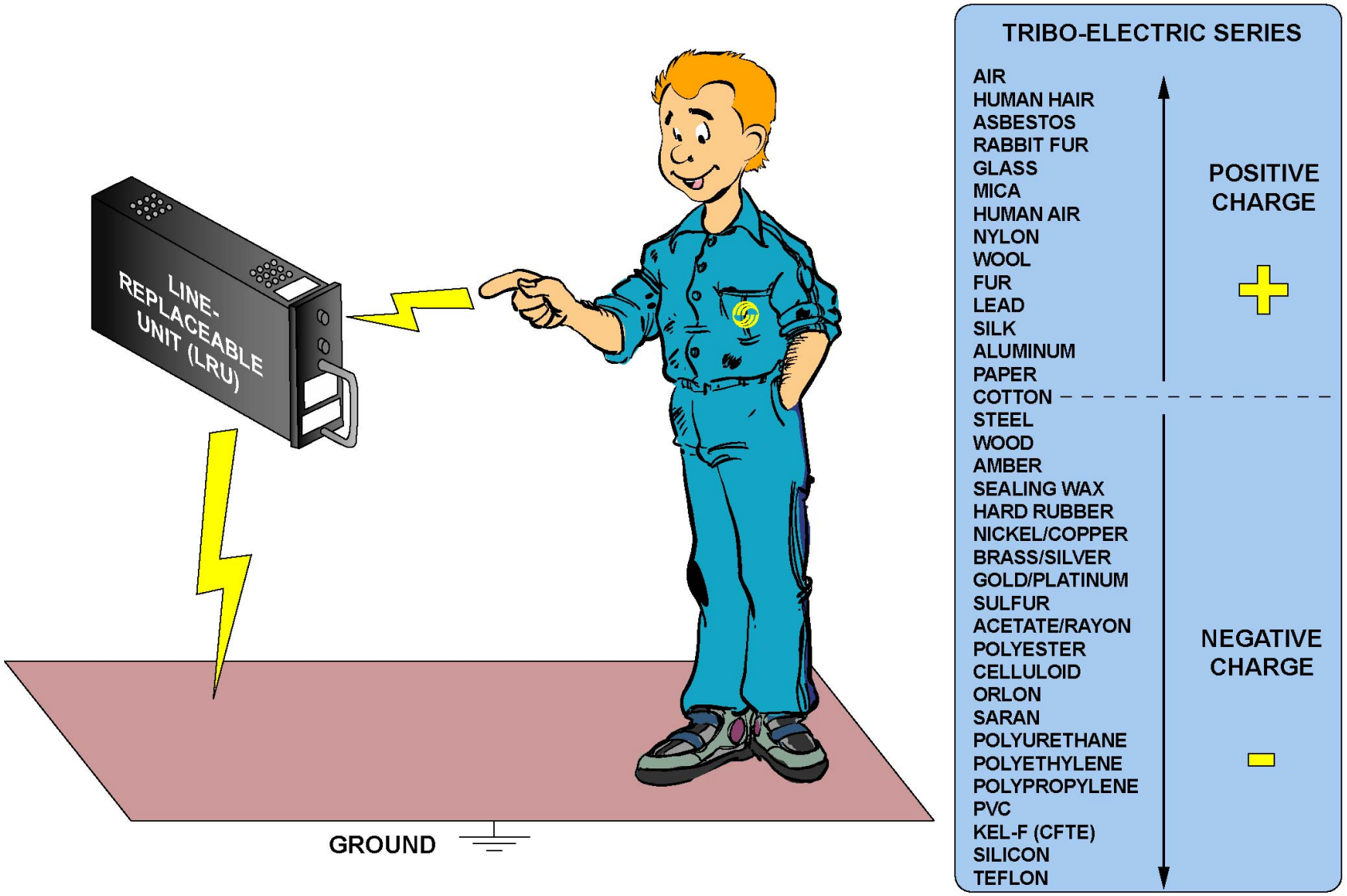
DESCRIPTION - VIDEO IMAGES DISPLAYED ON SYSTEM DISPLAY

ELECTROSTATIC DISCHARGE (2)

Electrostatic discharge PROBLEMS

Electro Static Discharge (ESD) is generated by rubbing materials with each other. By moving over plastic materials (synthetic fibers), wearing synthetic fiber clothing, electrical charges build up on the body. Thus voltages of 12000 to 35000 volts can develop on a person. Touching connector pins of computer units, a discharge path is formed through wiring and components. Integrated Circuit (IC) chips can be partly damaged or totally destroyed. Rubbing materials from the "tribo-electris" series against each other and then separating them from each other causes a build-up of electrostatic charges. If the materials are far apart in the series, there will be a higher electric charge.

UGB13131 - U7ST0M0 - UM01D3000000001



ELECTROSTATIC DISCHARGE PROBLEMS

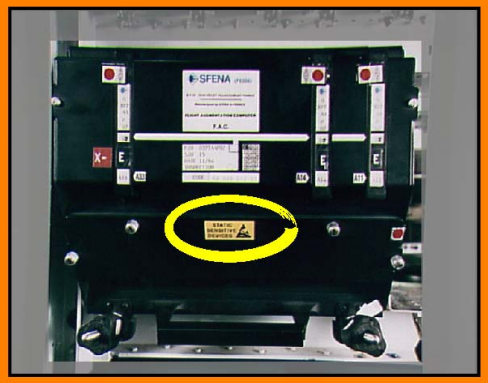
UGB13131 - U7ST0M0 - UM01D3000000001

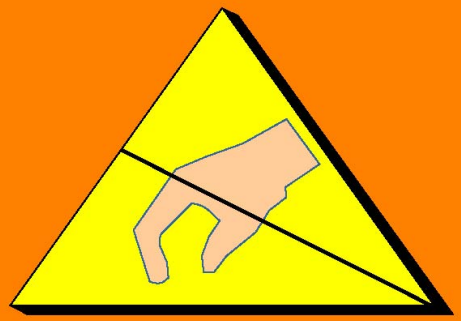
ELECTROSTATIC DISCHARGE (2)

electrostatic discharge protection

Here are some precautions to avoid damage of electronic equipment by ESD. Line Replaceable Units (LRUs) that are sensitive to ESD are identified by a black and yellow label on equipment face.

UGB13131 - U7ST0M0 - UM01D3000000001





1- DO NOT TOUCH CONNECTORS PINS, AVOID USING FLYING LEADS ON PINS FOR TESTING.

2- ESTABLISH GOOD GROUNDS (AS FOR FUELLING) IF A UNIT HAS TO BE SERVICED.

3- PUT YOURSELF TO GROUND:
EITHER DISCHARGE YOURSELF ON THE METALLIC STRUCTURE OR CONNECT YOURSELF TO GROUND VIA 200 000, ..., 1 000 000 OHMS OR A WRIST BAND WITH LEAD AND CONNECTOR.

4- WRAP UP THE UNIT IN CONDUCTIVE PLASTIC FOIL OR USE A CONDUCTIVE (BLACK) BAG.

5- PROTECT THE UNIT BY PLACING PROTECTIVE CAPS ON THE CONNECTORS.

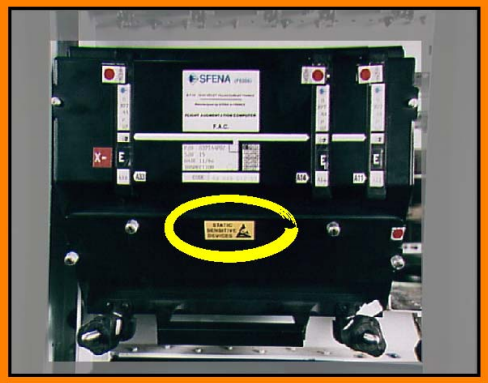
6- PLACE THE UNSERVICEABLE UNIT IN ITS RE-USABLE SHIPPING CONTAINER.

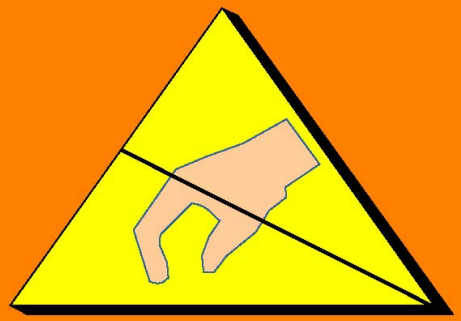
ELECTROSTATIC DISCHARGE PROTECTION

ELECTROSTATIC DISCHARGE (2)

LRU REmoval

Replacing an LRU bearing the black and yellow label requires these precautions.





1- FIRST DISCHARGE YOUR OWN BODY ELECTRICITY BY TOUCHING THE METALLIC AIRCRAFT STRUCTURE OR BY USING A GROUNDED WRIST BAND.

2- COVER CONNECTORS WITH PROTECTIVE DUST CAPS ON THE REMOVED LRU AND DO NOT TOUCH ANY PINS.

3- IN ADDITION, THE REMOVED LRU CAN BE COVERED WITH CONDUCTIVE PLASTIC WRAP. DO NOT USE ORDINARY PLASTIC WRAP.

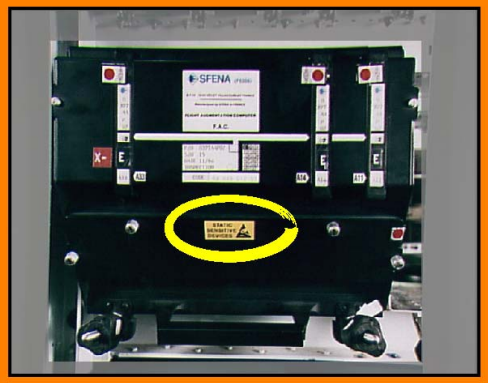
LRU REMOVAL

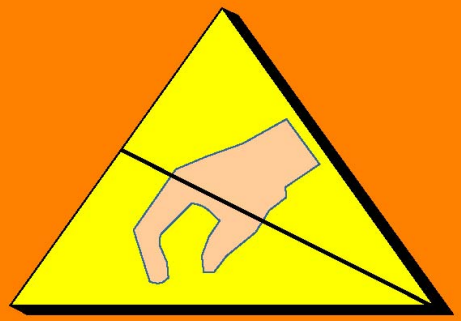
ELECTROSTATIC DISCHARGE (2)

LRU test

Testing of installed LRUs requires the following precautions.

UGB13131 - U7ST0M0 - UM01D3000000001





1- FIRST DISCHARGE YOUR OWN BODY ELECTRICITY BY TOUCHING THE METALLIC AIRCRAFT STRUCTURE OR BY USING A GROUNDED WRIST BAND.

2- WHEN CONNECTING TEST EQUIPMENT, FIRST ESTABLISH THE GROUND CONNECTION.

3- DO NOT USE LOW-IMPEDANCE MULTIMETERS OR DIELECTRIC TESTERS.

LRU TEST

ELECTROSTATIC DISCHARGE (2)

work station

The removal and testing of printed-circuit boards from an LRU bearing the black and yellow label, is carried out as follows.

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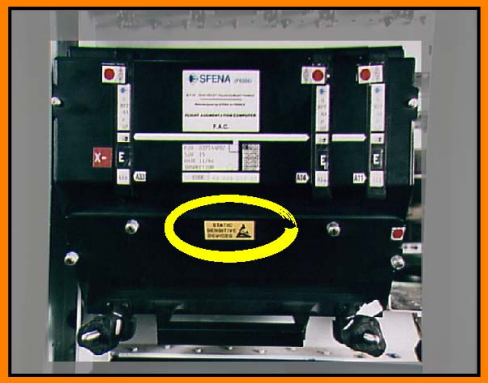

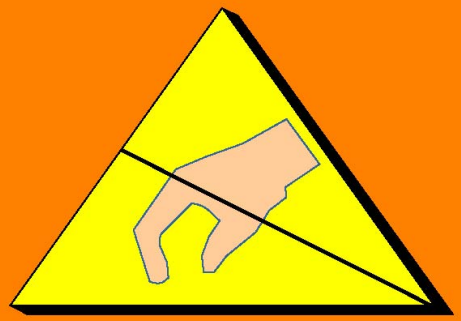

1- THE LRU CAN ONLY BE OPENED AT AN "ELECTROSTATIC DISCHARGE-CONTROLLED" WORKSTATION, WHERE THE BENCH SURFACE IS GROUNDED.

2- THE TECHNICIAN HAS TO WEAR A GROUNDED WRIST BAND.
ALL TEST EQUIPMENT AND TOOLS ARE GROUNDED.

3- REMOVED PRINTED-CIRCUIT BOARDS ARE STORED AND SHIPPED IN CONDUCTIVE PLASTIC BAGS OR CONDUCTIVE PLASTIC WRAP.

WORK STATION

COMMUNICATIONS SYSTEM LINE MAINTENANCE (2)

SYSTEM OPERATION

The use of the radio system on the Single Aisle aircraft is extremely important for the safe operation of the aircraft. While taxiing and towing, communication is necessary with the tower to safely move the aircraft. Basic system description and procedures will enable the student to understand system interconnect and correctly operate the systems by selecting frequencies and setting transmission and reception modes. In addition, the use of the Service Interphone communications will also be explained.
The Panels and equipment that will be explained is as follows:
- Audio Control Panel (ACP),
- Radio Management Panel (RMP),
- Audio Management Unit (AMU),
- radio transceivers,
- acoustic equipment that includes: boomsets, hand mikes, and handsets.

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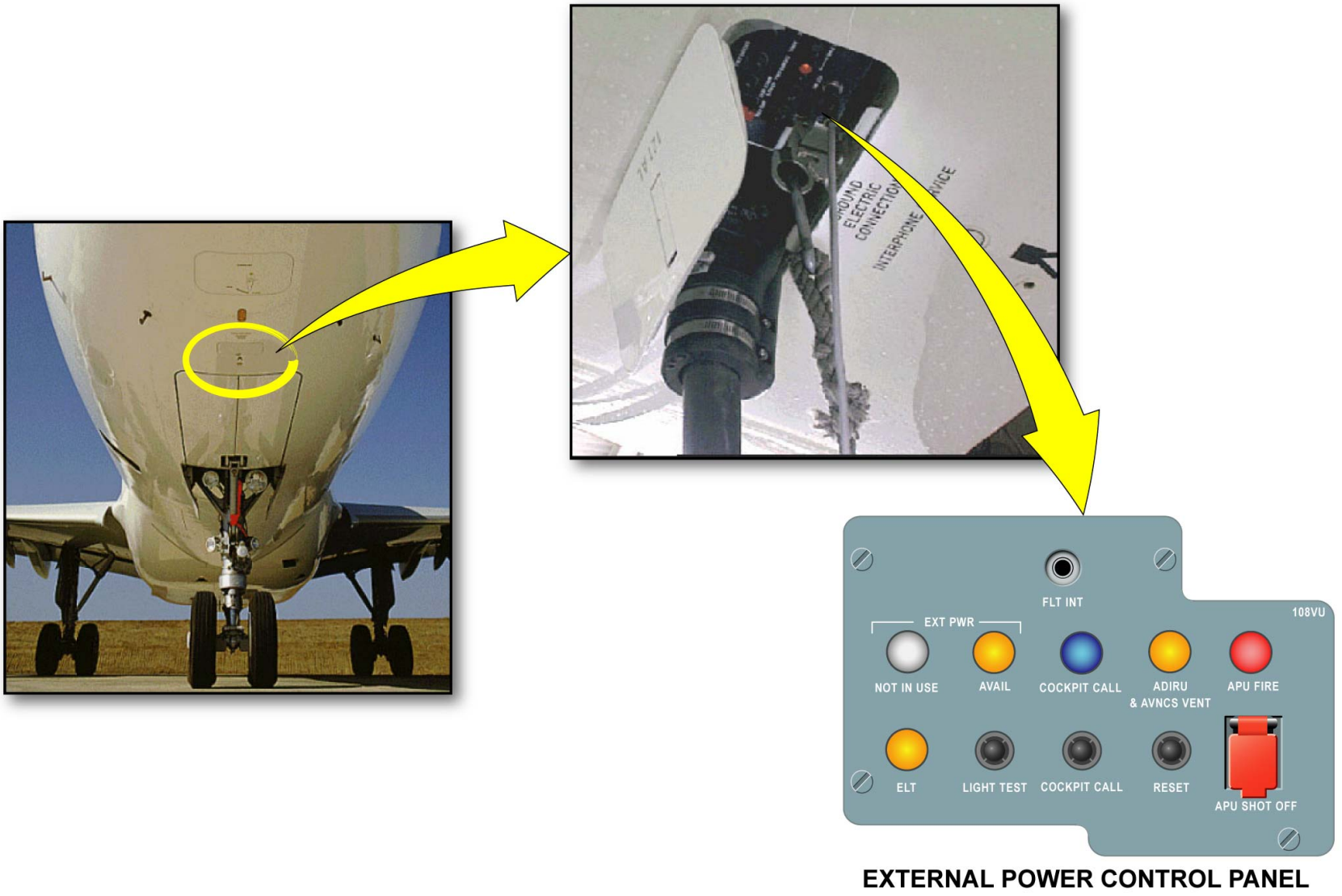


EXTERNAL POWER CONTROL PANEL

SYSTEM OPERATION

COMMUNICATIONS SYSTEM LINE MAINTENANCE (2)

SYSTEM OPERATION (continued)

RMP FREQUENCY SELECTION

The Radio Management Panels (RMP) are the Digital tuning head for the Communications transceivers. They are installed on the center pedestal, with an optional one installed on the overhead for the 3rd observer seat. The panels have an over center ON/OFF switch. When the ON/OFF switch is switched to the ON position, two frequencies that were previously selected appear in the ACTIVE and STandBY windows. To operate the transceiver, you might have to select a new frequency on one of the VHF or HF transceivers. To do this, you must select the transceiver that you wish to transmit on. To select the radio, the related radio pushbutton must be pushed on the RMP. The related green LED will come on. The desired frequency can be selected in the STand-BY/CouRSe window using the dual selector knob. Pressing the transfer pushbutton activates the frequency and displays it in the active window, whereas the previous active frequency transfers to the stand by window.

TRANSMISSION MODE

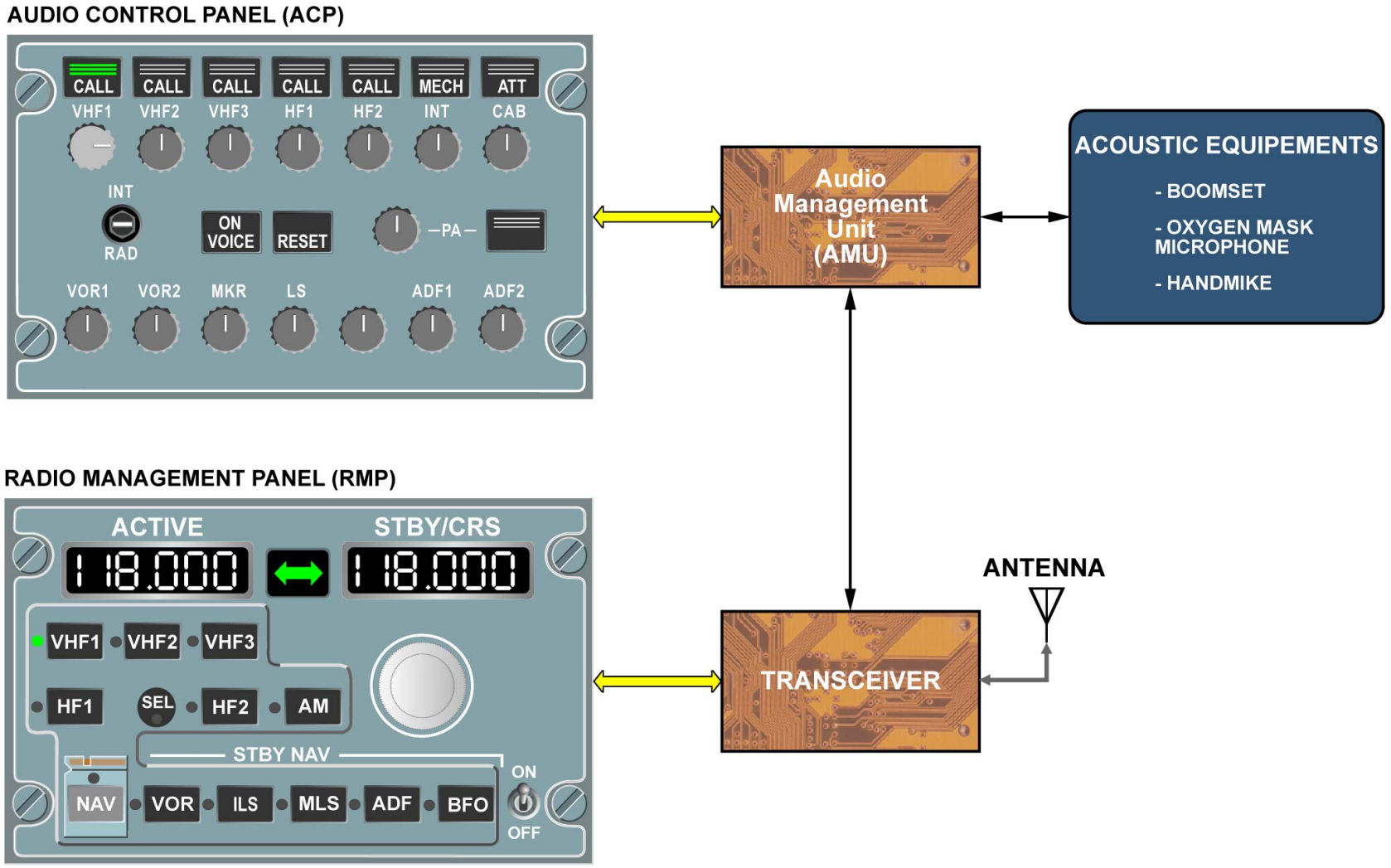
To connect one of the acoustic devices (microphone) to the transmission line, the related transmission key must be selected on the Audio Control Panel (ACP).
When the transmission key is pressed (green light on) you are ready to transmit. This selection can be disabled when you select another transceiver or when you press the lighted pushbutton again. Only one transmit key can be selected at a time.

RECEPTION MODE

In order to listen on the selected transceiver, you must operate the Audio Control Panel (ACP). On the ACP, the reception knobs are used to connect the acoustic equipment (headset) to the transceiver reception via the Audio Management Unit. To select a transceiver, the related reception knob must be released out. The reception knob comes on white. To adjust the reception volume level, the selected reception knob must be turned. Communication can now be established.

VHF 1 OPERATION

When a Push-to-Talk (PTT) switch is depressed on one of the hand mikes, the related hand mike is connected and the transceiver transmits.
The boomset mike is connected to a transceiver when the INT/RAD switch is held in the RAD position on the ACP or the PTT is pressed on the side stick.
On the ACP, several reception knobs can be selected simultaneously. If the reception knob is pressed in again, the receiver is disconnected and the white light goes off.



SYSTEM OPERATION - RMP FREQUENCY SELECTION ... VHF 1 OPERATION

COMMUNICATIONS SYSTEM LINE MAINTENANCE (2)

SYSTEM OPERATION (continued)

FLIGHT INTERPHONE SYSTEM OPERATION

Flight interphone selection is necessary for voice communications between flight crewmembers and for ground handling, taxiing and towing. This control is done using the ACP. If the flight crew needs to maintain contact and communicate with the mechanic, the flight crew can push the MECHanic pushbutton on the CALLS panel on the overhead panel.

The Flight Interphone can also act as a transceiver. Selection of the INTerphone transmission key lights the green bars, indicating that the flight interphone is ready to operate. Pressing and releasing the INT reception knob turns on the knob light and adjusts the interphone audio level.

The INT position enables permanent use of the flight interphone without any further operator action and independent of transmission key selection. The INT/RAD switch is a 3-position switch with INT being a stable position.

The RAD selection connects the pre-selected channel to transmit. The RAD position is a momentary contact, and is spring loaded to the center position. This position acts like the selection of the PTT on the hand microphone or the side-stick.

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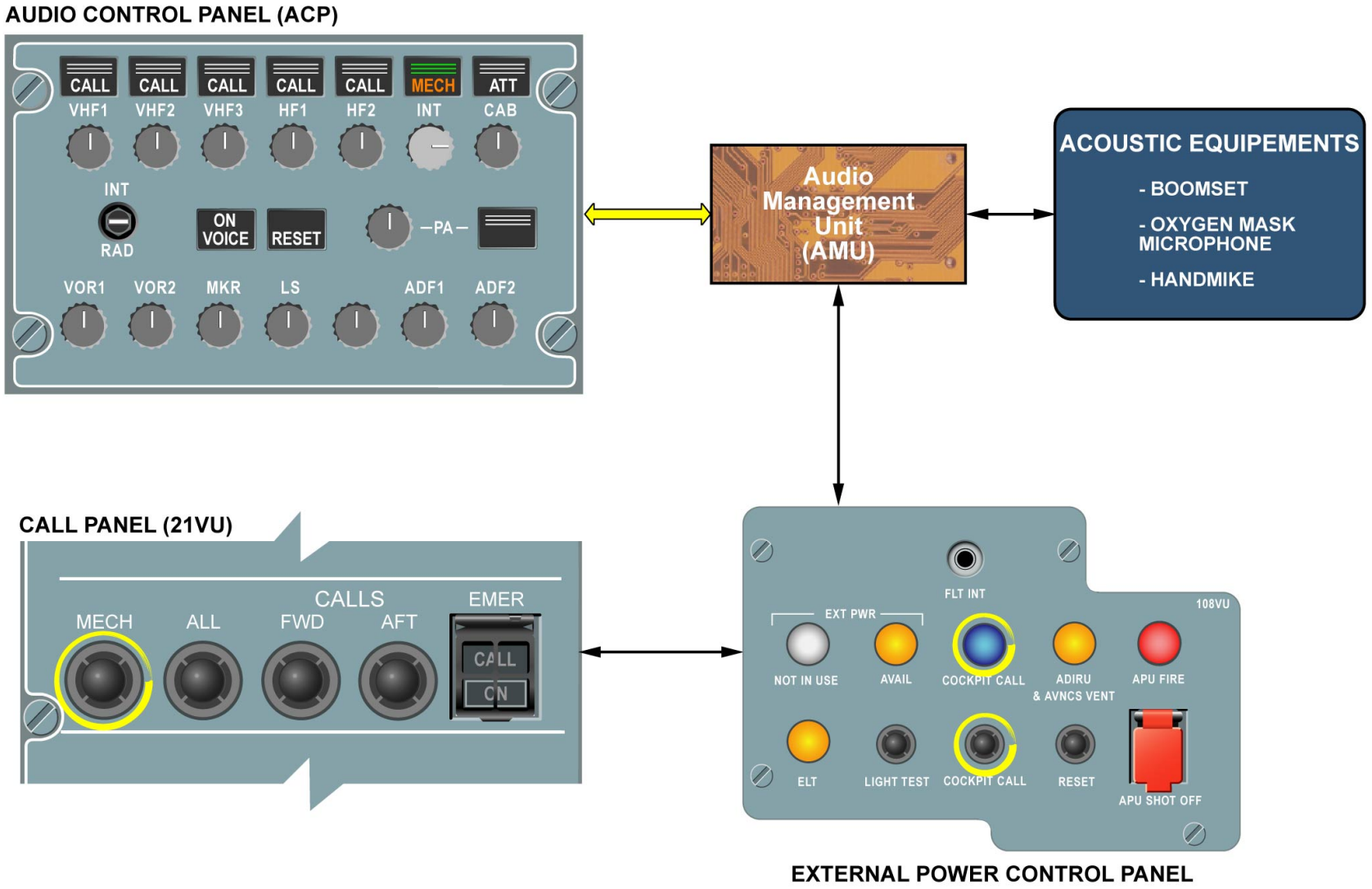

SYSTEM OPERATION - FLIGHT INTERPHONE SYSTEM OPERATION

COMMUNICATIONS SYSTEM LINE MAINTENANCE (2)

SYSTEM OPERATION (continued)

SERVICE INTERPHONE SYSTEM OPERATION

The service interphone system is made of eight service interphone jacks installed around the aircraft to make easier communications between maintenance personnel during troubleshooting, and between maintenance and flight crew when coordinating tasks; i.e. Manual air starter valve operation.

The audio lines from the cockpit, cabin and interphone jacks are routed to the AMU through the amplifiers in the Cabin Intercommunication and Data System (CIDS) Directors. The system is integrated in the CIDS directors. There are 2 modes to connect the jacks to the service interphone. The first one is the automatic mode which is active only on the ground with the landing gear down and compressed. The other mode is mentioned in the MAINTENANCE TIPS section.

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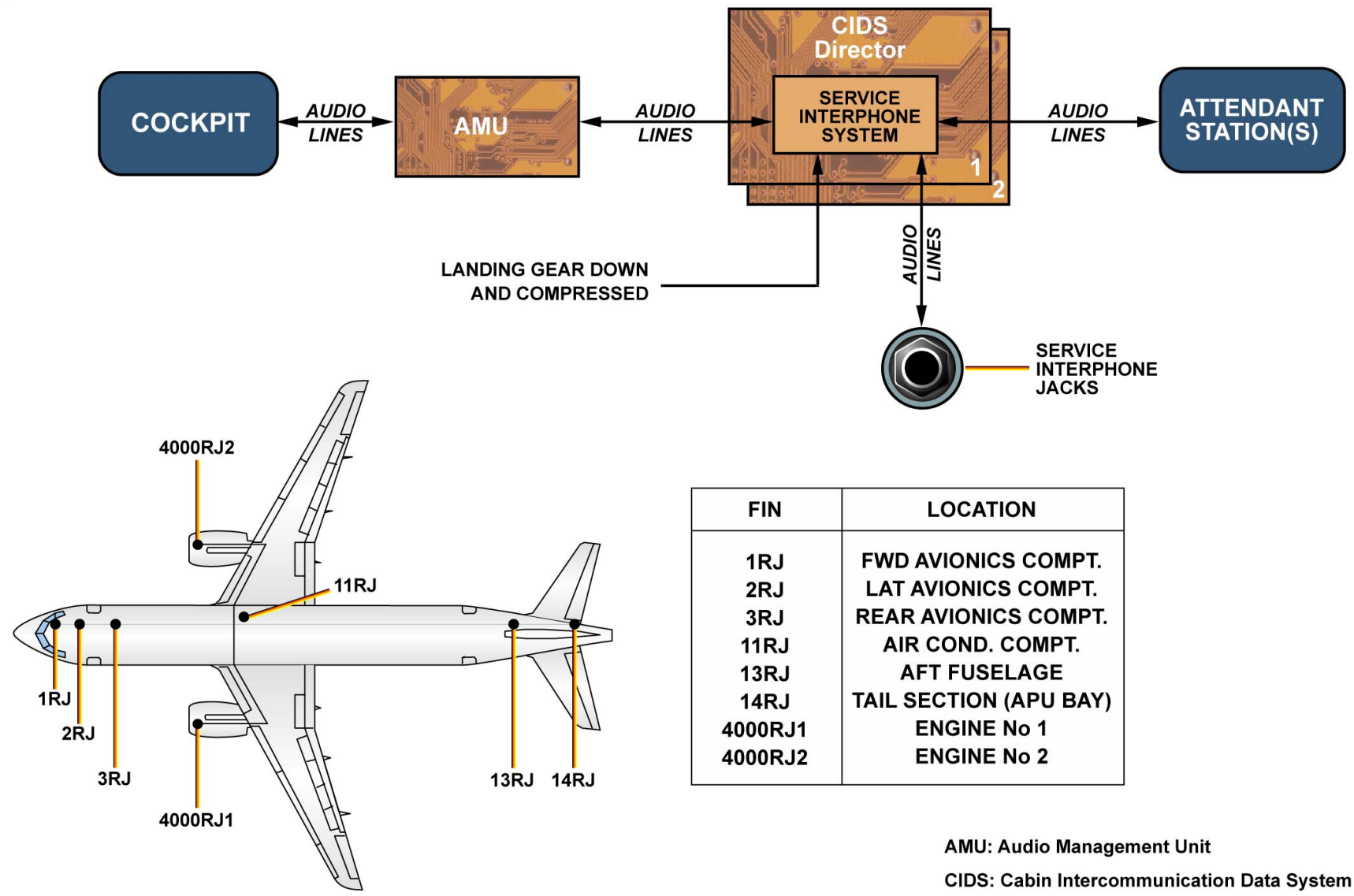

FIN	LOCATION
1RJ	FWD AVIONICS COMPT.
2RJ	LAT AVIONICS COMPT.
3RJ	REAR AVIONICS COMPT.
11RJ	AIR COND. COMPT.
13RJ	AFT FUSELAGE
14RJ	TAIL SECTION (APU BAY)
4000RJ1	ENGINE No 1
4000RJ2	ENGINE No 2

AMU: Audio Management Unit

CIDS: Cabin Intercommunication Data System

SYSTEM OPERATION - SERVICE INTERPHONE SYSTEM OPERATION

COMMUNICATIONS SYSTEM LINE MAINTENANCE (2)

MAINTENANCE TIPS

When jacking the aircraft it might be necessary to communicate between personnel at various points around the aircraft. With weight off wheels, the service interphone system is disabled due to the logic of the system. The on ground discrete from the Landing Gear Control and Interface Unit (LGCIU) disables all service interphone connections.
The reason for this is to stop potential static noise started and amplified through the AMU due to the length of wires acting as antennae, into the audio system.
To re-enable the service interphone, the SerViCE INTerphone OVeRriDe P/BSW must be switched to 'ON'. The Service Interphone Override switch is on the Maintenance Panel 50VU on the overhead in the cockpit.

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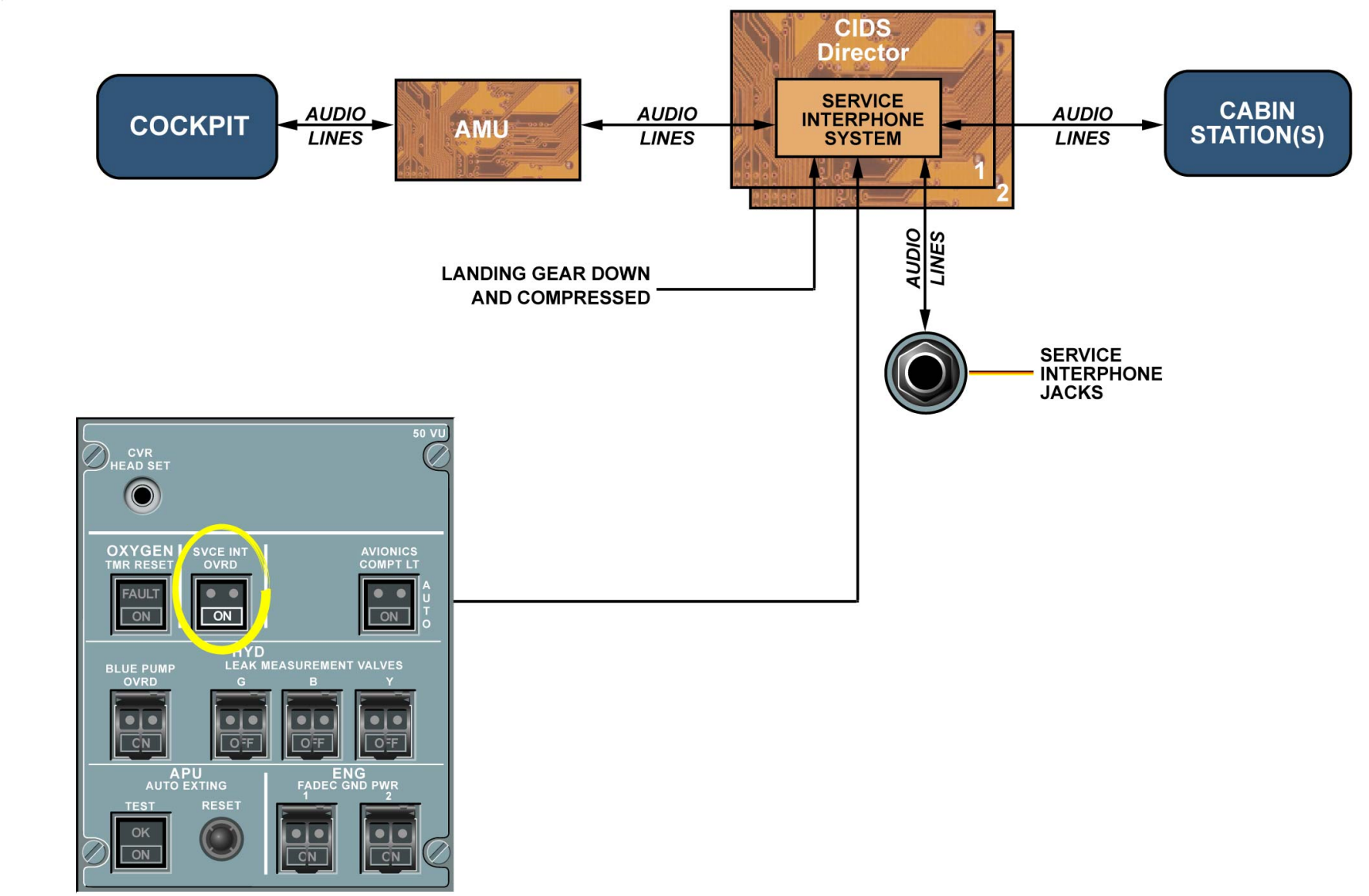

MAINTENANCE TIPS

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